The Builder.

VOL. LXVIII. No. 2712. JANUARY 26, 1895.

ILLUSTRATIONS.

Flamboyant Gate, Albi Cathedral, France.—Drawn by Mr. C. E. Mallows ..... *Double-Page Photo-Litho.*

Competition Design for St. Pancras Municipal Buildings.—By Messrs. F. H. Tulloch and Langton Dennis, Assocs.R.I.B.A. ..... *Double-Page Ink-Photo.*

Palazzo Notari, Ventimiglia, Italy.—Mr. W. D. Caröe, F.R.I.B.A., Architect .....

Small House at Brentwood: Front and Side Elevations.—Mr. E. A. Hill, A.R.I.B.A., Architect ..... } *Double-Page Ink-Photo.*

Itton Court, and a Lych Gate, Monmouthshire.—Mr. E. Guy Dawber, A.R.I.B.A., Architect ..... *Two Single-Page Photo-Litho's.*

Blocks in Text.

Sketches in article, "The Church of St. Mary, Harrow-on-the-Hill".... Pages 53, 59 | Plan of Block of Buildings, Wimbledon ..... Page 6

CONTENTS.

Church of St. Mary, Harrow-on-the-Hill	57	Palazzo Notari, Ventimiglia, Italy	66	Sanitary and Engineering News	70
	60	Small House, Brentwood	66	Foreign and Colonial	70
Architectural Association: Bricks and Brickwork	61	Itton Court, Monmouthshire	66	Miscellaneous	70
London County Council	65	Lych Gate, Monmouthshire	66	Legal	71
tectural Societies	65	Association of Municipal and County Engineers	66	Capital and Labour	72
neering Societies	66	The New District Councils and the Public Health Act	68	Meetings	72
eological Societies	66	Student's Column: Bricks and Terra-cotta.—IV.	68	Recent Patents	73
ay, Albi Cathedral	66	Obituary	69	Some Recent Sales of Property	73
n for Municipal Buildings, St. Pancras	66	General Building News	69	Prices Current of Materials	73

The Church of St. Mary, Harrow-on-the-Hill.

ONSPICUOUSLY set on its hill, hardly ten miles from London, Harrow Church should attract our readers to pay it a visit. Some fresh interest has lately attached to its chitecture. Inquiry into its history has en stimulated* by a commemoration last ar of the 800th anniversary of a consecra- on which links the structure with the nsured names of Lanfranc and Anselm. or Harrow Manor was early in Saxon nes granted to the see of Canterbury, d Eadmer, in his life of S. Anselm, lates how the archbishop came and con- crated, after a dispute with the Bishop London, the church there, "which had en Lanfranc's building." This was his rst consecration in England, and the date n be definitely fixed as January, 1094. To ark the occasion of this interesting com- emoration a sum of money has been sub- cribed, and proposals for its expenditure ve led to a better knowledge of the istory of the fabric. In 1893 some of e plaster covering of the tower was moved, and the dates of its erection n now be clearly conjectured. Fortunately, e complete stripping, at one time pro- osed, was stayed; so there still exists for us ne of the very few examples, which modern ethods have spared, of that traditional overing of rubblework which was usual Mediæval times. This last three months, an attempt to add an organ chamber to e south of the chancel, remains have been covered in its south wall of thirteenth- ntury windows, and this discovery finally ts the ground away from the theories hich have so long, and in spite of much idence to the contrary, attributed Harrow hurch—or, at any rate, some large portion it—to the fourteenth century.

It is now to be seen how the history of its chitecture has been misrepresented, as ich by the caricature of restoration as— ult added to injury — constant mis-description of its features. Misreport has acted on misrestoration, and *vice versâ*, till both the genuine forms and their traditions have fatally suffered. Lysons, in his "History of the Environs of London," was the innocent originator of some of this wrong. His words may be quoted: "Some parts of Lanfranc's building still remain, viz., the circular columns which divide the aisles from the nave, and part of the tower at the west end, where is a Saxon arch of singular form. . . . The church appears to have been rebuilt in or near the fourteenth century, being the kind of architecture then in use." This opinion of the architecture is loose enough, and the latter part of his statement, as to the fourteenth century, rests as clearly upon no evidence. But as to the first part he has consulted Eadmer, and since "Saxon" was the term in use in his time to denote the native Romanesque, which we call "Norman," his account is not incorrect. The outside of the tower window can now be seen, and may well be of Lanfranc's building—though the arch of the west doorway is certainly some fifty years later. But it has the look of an insertion, and the tower may have been built without it and have opened only into the church.* For being western, not central, as the Norman Lanfranc's tower should have been, its position is as at Iver, ten miles off (where parts of the eleventh century still remain), like those of other early churches within reach of a foray from the Thames, suggesting a retention of the Saxon type (built less for bell-ringing than for refuge and observation of the enemy), such as might well have prevailed in the earliest Norman time, when the fear of the Dane was yet in the land.

Only in the tower have remains of Romanesque work been found. Lanfranc's building was no doubt largely of wood, cut from the oak forest of the vale, some portions of whose woodlands still remained at the beginning of this century.† In 1080 other stone than the coarse ironstone, whose rough fragments are found here and there on the top of the clay, must have been hard to get, and its carriage always a very arduous undertaking across the clay bottoms that lie on all sides between Harrow and any quarry or wharf. Still, Lysons' assignment of the great round Tottenhoe pillars of the nave to Lanfranc shows a better appreciation of style than the guess-work of writers of our day, one of whom calls them early "fourteenth century," and another even fixes them to the date of Edward III.

His happy vagueness must really acquit Lysons of blame for the mystification of our contemporaries, who have with so much determination adopted the fourteenth century as the date of Harrow Church. Mr. Hartshorne, for example, in a paper read before the St. Paul's Ecclesiological Society in 1882, does not trust his eyes to examine the details of the church, but boldly advances the suggestion that if the mouldings look "thirteenth century," it is because they were made so by Scott's restoration of 1849. The stones themselves would rebut this theory, and the old prints of 1830 show that no such transformation of form took place. Yet Walford, in "Greater London," without hesitation, accepts Mr. Hartshorne's evidence, and stamping it with a precision of his own, declares that "the whole body of the church from the tower eastwards was apparently built in the first quarter of the fourteenth century;"* a statement that Mr. Percy Thornton varies after his own fancy in his "History of Harrow School" by fixing Edward III.'s reign as the part of the century wherein "the church was thought to have been rebuilt." But, as far as can be ascertained, no part of the nave of Harrow Church has either now, or has at any time had, the characteristics of fourteenth-century work, nor seems, indeed, within fifty years before or after that century. Archbishop Boniface held a visitation at Harrow in 1250; a chantry was founded by the rector in 1324; Weever in his "Sepulchral Monuments" says that there were monuments of the Flamberds, and there still exists a brass of Sir John Flamberd, who held lands in Harrow in 1390. A broken slab in the doorway of the muniment-room seems also of the fourteenth century, and there is a brass too to John Byrkhed, a famous rector of 1418. These would appear the sole memorials that connect the church with the two hundred years from 1250 to 1450.

* The Rev. W. Done Bushell has been collecting and noting many valuable documents that bear on the early history of Harrow.

* The existing arch into the church seems of the fifteenth century.

† Young oaks still spring up every year, and are cut down with the hav.

* Walford also says:—(1) that Scott lengthened the chancel in 1849; Lysons' print, however, shows that it was as long as now in his day: (2) that the noble timber roofs had been plastered, and were uncovered by Scott. The prints of 1830 show the roofs much as they are now.

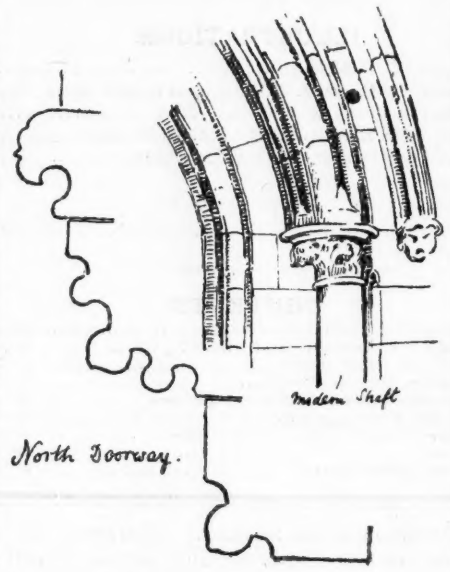
Yet a tablet set up under the tower advertises the subject of a stained-glass window—one of a series to be placed in the clearstory in illustration of the history of the church—thus: "Rebuilding of Harrow Church and addition of clearstory in Edward III.'s reign."

So slippery and longlived is the Proteus of error; for has there not always been the sham "fourteenth-century" of the chancel to give it backing? The label affixed by such an authority as Sir Gilbert Scott, has been sufficient for most people, and the whole church has its dates misread to fit the supposition of a "restoration." Yet no stonework of the fourteenth century itself has ever been shown. Scott's building was all new, keeping only the core of the old south chancel wall. And, indeed, to those acquainted with the methods in which he worked, the presumption is not strong that his restoration forms were suggested by anything he either found or surmised.

It is satisfactory, therefore, that the find of last month proves two things—not only that there was once an Early English chancel, built not far from the year 1200; but also that Scott knew of this early work, but did his building nevertheless in the Decorated style. There have been found three internal jambs (two right and one left,) apparently parts of three lancets some 15 ft. high, but with nothing to show their width—or, indeed, whether they were round or plainly pointed, or trefoil headed. The shaping of what is left of the internal arches suggests the same early date, as do the piers of the chancel arch. There is a peculiar set off for the rere-arch that is also characteristic. It is this feature which shows Scott's knowledge of it, for he has copied it in his "Decorated" windows, an anachronism of about a hundred years. A good deal is left of the original plaster facing of the stonework, with its painting, and a subsequent repainting thereon in a hotter colouring. This latter is on one jamb a range of broad red chevrons, and on the adjoining (not yet fully displayed) what seems to be a lion gardant. Should these be shown to belong to a particular coat-of-arms some evidence may be gained as to the date after which the thirteenth-century windows were blocked. From the nature of the filling it would seem certainly Gothic. In it has been found parts of a foiled arcade with a bit of Early English label, and also what would seem the portions of an internal string, of the same section as that of the Mytton Chapel at Bredon.

That Scott, though finding traces of this work, should have preferred to make his style that of a hundred years later, is, after all, natural under the circumstances of a restoration in 1849, a time when it was almost a matter of conscience to consider Decorated art as the most "Christian";—an excuse in itself for the demolition and alteration of our historic churches, if they did not conform to its standard. So, in style as in outline, his rebuilding departed from the original tradition of the church; and a wide, rather shapeless, north aisle, and beyond this again a vestry, was put to fill the north-east angle of the original cross-plan. It is fortunate that the nave did not suffer such a complete transformation. Externally, indeed, it was completely refaced in flint in place of the traditional plaster, and all its windows were renewed, save those of the north transept and aisle—which, however, some fifteen years ago had outside their old stone replaced by inferior; inside they still retain it. Most fortunately, too, owing to lack of funds, the tower was preserved from the mischief of a similar refacing. It was again rescued this last year, and it is to be hoped that the tradition of these escapes will form a precedent for its future preservation.

The south porch was completely re-surfaced: the north porch and stair-turret adjoining were built quite new. There are no prints to show what there was before on the north, but there may have been a seventeenth-century staircase to the gallery here. The north doorway itself has, however, received less renewal than any other part of the fabric, and its mouldings and the ironwork of its

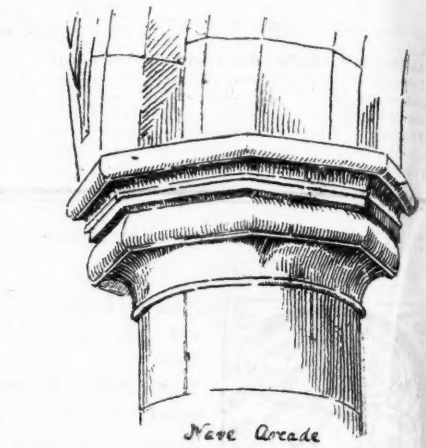


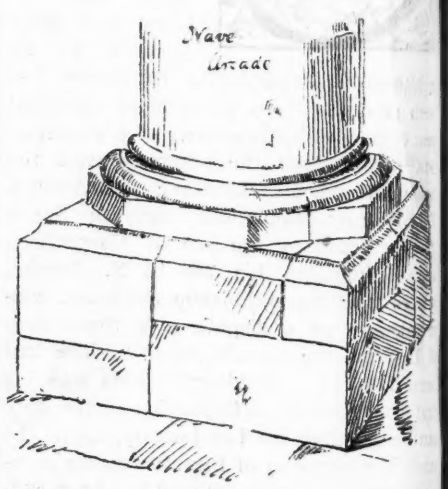
door are most valuable. Inside, everywhere, the stonework has been furbished up, and much of it renewed; the Bath stone usually shows what is the new, but in some cases additions have been made out of pieces of old stone. The walls everywhere were replastered, the oak roof thoroughly repaired and varnished (a fresh coat of treacly oil was put on a few years ago); but the great wood effigies, though defaced, it is said, by Cromwell's troops, were not effaced by "restoration." However, a clean sweep was made of the pewing and furniture of the church, with the exception of the font and part of the pulpit. Much of these fittings were, no doubt, dilapidated, and it must be said that sound, strong, oak seatings were put by Scott. But old water-colours and prints show much beautiful work in the screens and reading-desk, and their substitutes are ugly and mean. The sounding-board was exceptionally fine. It would be a real restoration if it could be found and put back, for the design of the pulpit has lost enormously by its disappearance. This, however, took place some years before the "restoration," though at that time other portions were removed and the staircase altered.

The crime of all these fittings in the eyes of the restorer of 1849 was their date from the seventeenth and eighteenth centuries, those dark ages to the ecclesiologist reared in the school of the "Revival." But it is painful to think of so much beauty of genuine devotion cast out and broken up, and to see nothing better come into its place than the tawdry insincerities of the ecclesiastical furnisher. Mr. Hartshorne, speaking in 1882 of this work of '49, and deploring with good reason the immense loss of what was both artistically and historically priceless which it occasioned, adds, "It was cheering to believe that a restoration of the kind which this church underwent would be impossible in the present day." Perhaps so; but these destructions were, at any rate, at the imperative, if mistaken, bidding of a religious enthusiasm; and, moreover, Scott's treatment of the chancel kept the tradition, if not the style, of that fuller lighting which, for convenience sake, thirteenth-century chancels almost always in later Mediæval times received. He put his windows where there were windows before. But it is difficult to find excuse for what is now being done in 1895—the removal of his windows, and the substitution of a "restoration" still more dubious, that sets both tradition and convenience at defiance—from the fragments of three lights setting up five, and so uncertain of itself that it hesitates whether these shall be 10 in. or 14 in. wide! It should be known upon what slender basis this work is resting; and it is to be hoped that, on the practical point of lighting only, Scott's restoration will again be re-restored.

Taking the church as we have it to-day, and reading the evidence of what is left to us, the great rebuilding, which settled for six centuries its extension and general outlines, was started late in the twelfth century or early in the thirteenth; the first half of the thirteenth century completed the fabric; the latter half of the fifteenth raised the body, the tower, and spire, and added the south porch; and Scott, in the middle of the nineteenth, put, on the north, the porch, the vestry, and chancel aisle.

The earliest "Early English" is shown in the chancel, in the piers of its arch;





in the nave, in the round massiveness of the pillars, and, to some extent, in the arch that opens from the south aisle into the south transept. Generally, the mouldings of the nave are those of the first half of the thirteenth century; but the entrances, especially the untouched work of the north doorway, with its original door and ironwork, are at the end of this period, and perhaps later again was built the archway (which seems an insertion) set between the north aisle and north transept. Some people see also an Early Decorated character in the labels and respond mouldings of the arches that open from the nave into the transepts, but there is hardly the delicacy of that late date, and the forms themselves have often been found associated with much earlier work, even with that of the twelfth century.

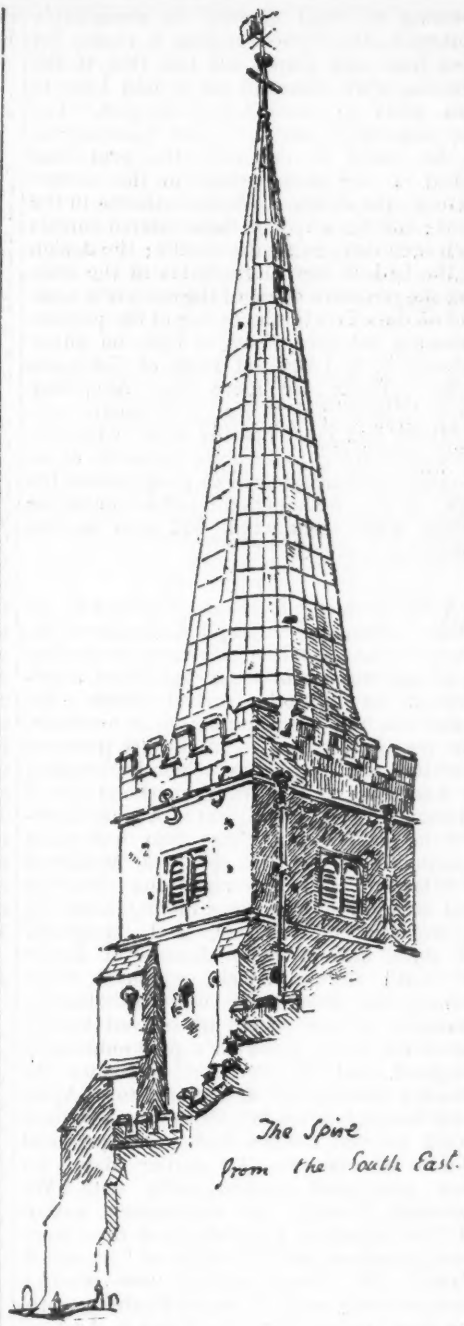
The fine scale and completeness of this thirteenth-century parish church must, no doubt, be attributed to the patronage of the archbishops, whose ownership of the Harrow manor made them not unfrequent visitors there in the twelfth and thirteenth centuries. Coming into residence at his manor-house—which certain remains* show to have been probably on the site of "the Grove" a house close to the north-east of the church—the prelate would desire a church worthy of his dignity, and a choir in which his attendant

* An ancient and very deep well, lined with stone, has been found.

precentors could be fitly accommodated. The fine height and spaciousness of the chancel-arch are very remarkable. Another peculiarity lies in the massive piers which form the western responds of the first bays (from the chancel) of the nave arcade. The idea that the transepts, with the arches into them, may have been later additions, does not suit the facts of the case. Old prints show that before the "restoration" the abaci of the responds did not run through across the piers as they now do. This and other peculiarities suggest that there might have been a wall, some 2 ft. thick, built right across the nave, and that probably the choir and transepts only formed the first complete building, the nave being set out but not immediately proceeded with.

When Archbishop Beckett visited Harrow in 1170 he seems to have come among his enemies, for even the parish clergy were insolent to him, and tried to do him an injury. He went on to Canterbury, and there excommunicated them two days before his assassination. There is evidence to show that his successors in the see were not free from nervousness as to a similar fate, for their ordinances at Canterbury after the new building there became strict as to the admission of the public within the precincts of the choir. Here, at Harrow, on building the chancel which was on occasion to be the chapel of the Archbishop, it may have been thought well to restrain a too-free admission of the public to the services held therein. So the north transept, on which side was the Archbishop's entrance from his manor-house, would be walled off from the aisle, and the enclosure would be carried right across the nave, leaving the parish admittance to the south transept only. At any rate, this supposition fits the fact of the arch from the aisle on the north side seeming to be a later insertion. It is to be noted, also, that there was certainly a doorway before the "restoration" into this transept, close to the north pier of the chancel arch; and, on the other hand, no indication has been found of the usual door on the south side of the chancel. Of course, such enclosure and arrangements as we have here suggested are common enough in monastic churches which gave their naves to the parishes. Brecon Priory Church still shows the north aisle solidly walled off from the transept, and at Canterbury itself there was a block in the same place caused by the Altar of the Virgin being there put. The exceptional circumstance of the chancel having to be used as the archbishop's chapel may have led to the same arrangement being designed for a parish church at Harrow. All this part would be probably finished with despatch, making a wide pier necessary for the abutment of the first arches, while the rest of the nave was proceeding more leisurely. Accordingly, the nave arcade in its capitals and arches shows somewhat later details. Above the piers can still be seen in the wall the inner jambs of the original clearstory windows, which were cut off by the fifteenth-century raising of the clearstory. It is odd that there seems to have been a window squeezed in between the west wall and the first arch. Thornhaugh, Northamptonshire, and Woodham Ferris, near Chelmsford, show just such thirteenth-century clearstories, in each case over arcades that seem almost of the twelfth century. With the re-building of the nave at Harrow went on the raising of the tower; and if Scott, in his restoration, faithfully copied the stonework which he found in the fine double lancet that lights the tower space, that window was put about 1250, and of much the same date seems the stair turret at the south-west angle of the tower. Somewhat later was the arch which we have mentioned as inserted between north aisle and transept. In 1250 was Archbishop Boniface's visitation held at Harrow, and this probably marks the completion of the thirteenth-century church.

In the first quarter of the fourteenth century the Grange of Headstone, two miles off, became the property of the archbishops,

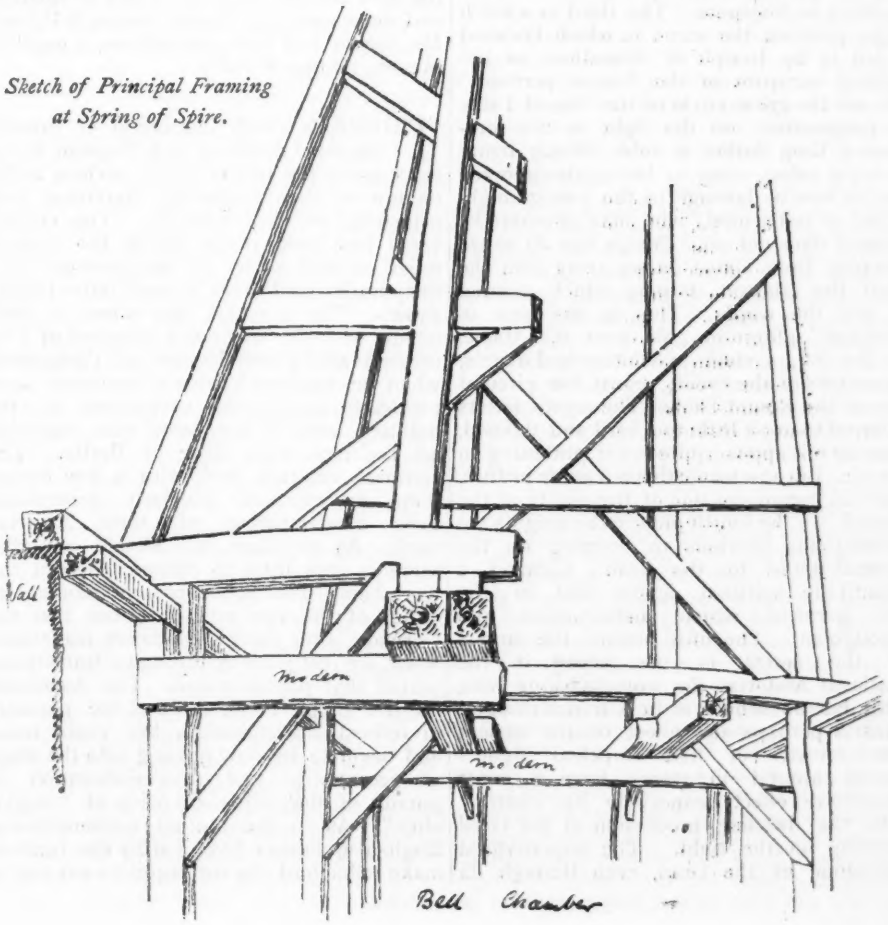


and thenceforward we do not hear of them at Harrow itself. Towards the end of this century new classes had come to the front, and we find here, as elsewhere, wealthy rectors and landowners commemorated by monuments and brasses in the churches, which they had doubtless adorned by their benefactions. A chantry had been founded in 1324, and there was a roodloft, for which the north transept arch has been raised to give head-room. The stair to it was found in the north pier of the chancel arch, but there are no indications of its date. Its erection may possibly have ensued on the removal of the archbishop's enclosures some time after 1260. No vestige of Mediæval furniture is left, nor of the four altars which are said to have been in the church.

It was in the latter half of the fifteenth century that considerable alterations were made to Harrow Church, as to so many others in the wealthy parts of England. The noble clearstory was added to the nave, and both aisles and transepts raised—the original thirteenth century height being shown by a batter of the walls, some ten feet high. The windows were everywhere renewed, in chancel probably as well as nave, and the ceilings completed with fine massive flat roofs, richly carved and painted, corbelled all down the nave on great oak figures set in canopied niches. A part of one of these canopies with the original gilding is to be found in the "muniment room." This room, over the porch, has escaped restoration. Its ceiling shows bits of the old painting, as also does a fine fifteenth century stone niche set on the east wall. There is now no stair to the room, but a door in the east side shows that it must have had an external entrance. The door into the church may have led to a private pew, or the room may have been in connexion with the chantry dedicated to the Virgin.

With the raising of the clearstory came the building of another story to the tower, and the setting thereon of the tall leaded spire, which makes Harrow such a conspicuous landmark. The internal construction of this spire, and the methods by which its strains are brought down inside to the lower stories of the tower, which at the same time or earlier had been much buttressed, make its framing a wonderful piece of carpentry. It was well and ingeniously

Sketch of Principal Framing at Spring of Spire.



strengthened by Scott, and bids fair to last another four hundred years.

It remains to speak of the font, which is of Purbeck marble, and a most beautiful piece of plain sculpture. In Lysons an engraving of it shows spurs at the base that have now gone. It seems at some time early in this century to have been removed from the church, and put up in a garden, but was returned before Scott's restoration. He added the stone base, and put a new rim. It is strange to find Mr. Hartshorne describing this fine work as "rudely carved, and probably a remnant of Lanfranc's church." Its material, as well as its workmanship, point to the last quarter of the twelfth century. The finely-cut lily of the bowl recalls the carving of the capital dug up in the nave of Strata Florida in 1888, and is like some other remains of Cistercian sculpture which have been put in the "Museum" at Fountains.

NOTES.

THOSE who have hitherto known Mr. E. A. Abbey only as a painter of *genre* pictures and an able illustrator in some of the American illustrated magazines, must have had a delightful surprise on visiting last Saturday the private view, at 9, Conduit-street, of his paintings for the decoration of the Public Library of Boston (U.S.A.). These form a portion of a series illustrating episodes in the history of the search for the Holy Grail in the Arthurian legend, the subject being treated so as to make Galahad the central figure, by concentrating on him some events which in the old legend belong to different knights, just as Tennyson has done to some extent in his "Idylls." A glance is sufficient to show that this is a collection of decorative paintings of more than ordinary interest and genius. Five of the pictures are completed; more are to follow. The first represents the visit of the angel bearing the Grail to the infant Galahad, a beautiful child who holds up his hands towards the sacred relic. This is the only one of the set which displays a purely decorative background, there being a mass of blank wall behind which is relieved by a pattern with conventional symbolic animals introduced. The second picture represents Galahad in complete chain armour, kneeling before departing on his quest, Sir Launcelot buckling on his spurs. The third is a much larger painting, the scene in which Galahad is led in by Joseph of Arimathea, as the rightful occupant of the "siege perilous." We see the great circle of the Round Table in perspective; on the right in the foreground King Arthur, a noble elderly figure in royal robes, rises in his richly-canopied seat to bow in homage to the young knight "clad in red sendel," who may sit where he himself dare not sit. Beside him an angel, stooping from above, draws away from the chair the crimson drapery which covered it, and the words "This is the seat of Galahad" glitter in gold over it. Above, on the left, a choir of white-robed angels, spectators of the event, repeat the circular line of the Round Table. The mystic letters referred to are a little too hard and defined, they do not appear quite as if glittening in the air. But as a whole this is a noble picture, and half persuades one of the reality of the legend. In the fourth picture the knights are worshipping previous to entering on the general quest for the Grail; Galahad, a beautifully spiritual figure, still in the red garment which distinguishes him throughout. The fifth picture, the largest of the series, is the scene in the castle of Amfortas, the wounded king who, with his household, is in a trance of ages. This is perhaps the finest of the series; the crowd of half-stupefied figures seated around in trance have a most impressive effect, especially by contrast with the dazzling procession of the Grail entering on the right. The supernatural splendour of the Grail, even through its covering of "red samite," is remarkably conveyed; the figure carrying it closes her eyes from the glare; we feel that if the covering were removed we should have to turn away to avoid being dazzled. The fine decorative effect of the paintings is to be noted throughout; the gem-like glitter of the chain-armour in the second picture; the design of Arthur's throne in the third; the fine effect of the clustered shields with their devices in the fourth; the design of the bed or bier of Amfortas in the fifth, and the powerful effect of the mass of bronze and of dark furs in the centre of the picture, throwing out the effects of light on either side of it, and the red mass of Galahad's cloak. These are more than decorative work, however; they are noble poetic conceptions, and most heartily do we wish that they were going to decorate the walls of an English building, instead of going across the sea. It is to be hoped the remainder of the series, when completed, will also be exhibited in London.

WE much regret to have to record in our obituary paragraph the death of Mr. Paley, of Lancaster, whose name is familiar to all our readers as one of the ablest architects of the old Gothic revival school. Mr. Paley was not only eminent as an architect, but was greatly respected for his personal qualities, and the position which he occupied in Lancaster and its neighbourhood was a somewhat exceptional one. As an architect he was one of those who had most thoroughly caught the spirit of Mediæval architecture, and his numerous churches and other buildings were distinguished by a breadth, massiveness, and simplicity of style, and a total absence of showy or florid detail, which rendered them among the finest and most satisfactory examples of the school of revived Gothic which for many years was predominant in England, and the traditions of which he steadily maintained and clung to. Apart from his profession, Mr. Paley was a man of much general culture and great personal charm of manner. In earlier days he was associated professionally with Mr. Edmund Sharpe, the well-known author of "Architectural Parallels," and their work was carried on under the style of "Sharpe & Paley." Mr. Sharpe retired from practice comparatively early in life, and subsequently the firm became that of "Paley & Austin," and, more recently, "Paley, Austin, & Paley." Mr. Austin had been, we believe, a pupil of Messrs. Sharpe & Paley.

THERE is much discussion at present between Austrian and German architects as to the merits of the modern architecture of their respective countries, and, primarily, of their capitals. The controversy has been taken up by the general press as well as by our architectural contemporaries, and there is much bitter feeling shown. The question was raised in connexion with the Emperor's criticism of Professor Wallot's new Houses of Parliament, when an eminent Vienna connoisseur most recklessly condemned everything in the building, and at the same time ridiculed all the new work done at Berlin. The Germans retorted, and, with a few exceptions, unfortunately similarly generalised their condemnation of their Austrian work. As outsiders, we should say that there is very little to choose between the work being done at the present moment in either of the two countries, but that the Germans, after years of mediocre academical work, are just passing through a transitional period that promises well. The Austrians, on the other hand, reached the pinnacle of refined academicalism ten years back, and seem to be now passing into the stage of eccentricity and over-elaboration in pursuit of the will-of-the-wisp of "originality." As to the mutual recriminations, English architects have hardly the right to make reflections, for we regret to say that it is the rarest thing possible to find any English architect praise the work of another—unless in a Presidential address.

THE ambitious scheme of draining the Zuyder Zee, to which we referred some time back, will now probably soon be taken in hand. According to our Dutch contemporaries, the special Government Commission entrusted with the examination of the Zuyder Zee Society's scheme approve of the proposals. The plans are considered feasible and advantageous to the country, and the enormous cost to be incurred is expected to be covered by the sale of the ground reclaimed from the sea. The only question raised seems to refer to the powers of the National Exchequer to devote money to works which will at the best only return capital in full with a very small interest, and that some forty years hence. The general press, however, appears to be in favour of the expenditure, if only on account of the work it will find for the many unemployed. It is not intended to reclaim the whole of the area at present taken up by the Zee, but to leave a broad central waterway and a canal to Amsterdam. The Zee will be cut off from the North Sea by an enormous dyke, and then the "polders," or stretches of reclaimed land, will be gradually formed on either side. The whole of the works are estimated to cost over 26,000,000*l.*, and will take about thirty years to complete. The sale of the reclaimed land is estimated to bring a return of 27,000,000*l.* The engineer who is responsible for the scheme as it now stands is Herr Lely, who some time back occupied the post of Minister of Waterways in the Dutch Government.

THE circular of the Education Department to the managers of elementary schools on the subject of taking precautions against fire is well-intentioned, but somewhat late in the day. The chances of fire, also, in school buildings during school hours are very slight. But for many reasons it is desirable that doors should open outwards in these buildings; there may be at any time a crush against a door opening inwards which in some way might cause danger to the limbs of the children. The Education Department would do well, however, to call the attention of the managers of the elementary schools to the desirability of seeing that the sanitary state of the houses which are frequently attached to schools and are inhabited by two or more teachers is satisfactory. The Department has no direct authority over these houses; they are not, so to say, "official" buildings, since it is a matter entirely in the hands of the managers to provide house accommodation or not as they please. But the Department, though it cannot control the sanitary state of these dwellings, is yet at liberty to give advice in regard to them. There is no doubt that many of these houses, more especially in the rural districts, are in an unsatisfactory sanitary state. The schools themselves are not all that could be wished, nor will they be until they are inspected periodically by competent sanitary inspectors. The cursory glance of the inspector—who visits the school once a year to test the knowledge of the pupils—into closets and dustbins is little better than a farce.

THERE was a narrow escape of a theatre fire with a heavy loss of life during a performance at the Darwen Theatre Royal last week. The fact of there being sufficient exits, and an energetic theatre manager in the auditorium, prevented any casualties from panic; whilst a handy hydrant, with a spirited actor to use it, saved the house from destruction. We do not hear of a fireman having been on duty in the building. It is unnecessary to dwell on the risks in our theatres and public assembly-rooms; but we would mention that last year has seen several of our provincial theatres burned: Reading, Longton, and Southend, for instance.

Fortunately the fires, however, did not occur during the performance, and there was no loss of life. We should consider ourselves lucky that matters have been no worse, when we recollect the death-traps the public constantly enter.

MR. BLACKBOURN'S paper on the new Building Act, read at the Surveyors' Institution on the 21st, was in general favourable to the Act, and did not contain any very special criticisms. The author defended the form of words "The Council may permit," which occur so often in the Act, as allowing a desirable power of relaxing the conditions of the Act under special circumstances. Mr. Blackbourn makes one criticism, however, in which we concur, viz., that in the re-arrangement of the requirements as to thicknesses of walls, the best has not been done in regard to walls under 30 ft. He says: "The deficiency was not in strength, but in the manner of building, and in the impotency of an ordinary 9-in. wall to keep out damp. But if this latter was the view, why should any 9-in. external walls be allowed?" We are quite of the same opinion; we consider 9-in. walls are too thin for external walls of a habitable building. But what an outcry there would have been if they had been condemned!

ON Thursday, the 17th inst., Mr. F. W. Rudler, F.G.S., Curator of the Museum of Practical Geology, gave a lecture, at the Imperial Institute, on "Decorative Building Stones." A very good selection of marbles, serpentines, granites, &c., was arranged on the platform; they were mostly the property of the Institute, or of Mr. W. Brindley, who occupied the chair. The lecturer commenced by alluding to the well-known Egyptian porphyry, obtained from ancient quarries, a specimen of which was exhibited. The green porphyry of Laconia was compared with a similar rock from Lambay Island, off the Irish Coast, and these and the elvans and luxullianite of Cornwall were described in much detail. It appeared to us that many of these stones, which are not now worked for decorative purposes, might well have been omitted from a general lecture of this kind, the more so as the chairman announced that the observations would especially refer to Colonial decorative stones. However, a porphyry from Chatham, in Quebec, and two or three other similar kinds of material were recognised. Then the porphyritic granites of Devon and Cornwall, and those from Shap, were taken as types of their order, and in speaking of granites generally the lecturer remarked that although Canada was rich in that class of stone it was practically unworked. This remark might have been somewhat modified, for we learn from the official statistics that the quantity of granite raised in the Dominion per annum is valued at about 14,000*l*. Canadian labradorite was described in some detail, after which the origin of marble was inquired into, when the time-honoured experiments of Sir J. Hall, who artificially made crystalline limestone by placing powdered earthy limestone in a closed gun-barrel and subjecting it to great heat, were brought into requisition. The geological horizons from which marbles have been obtained in the British Isles having been explained, as well as the nature of the materials themselves, we could not help noticing that undue prominence was given to those from the Wealden, Purbeck, and Forest Marble formations, whilst the Devonian and Carboniferous marbles — practically the only ones now raised—were barely mentioned, though two or three were alluded to. Speaking of the Carboniferous Limestone of Derbyshire, it was stated that part of the Imperial Institute was built of the stone from Hopton Wood, near Wirksworth, which is quite right, only a slight slip was made in saying that it does not take a good polish; it takes a very fine one when required. A few marbles from India next claimed attention, as well as some from New South Wales and Natal. Alabasters and serpentines were given at great length; in connexion with the latter the "Irish green" of Ireland, that from the Lizard, and three or four ophi-calcites from the Colonies were taken as types. The lecture was interesting enough from some points of view, but we should have preferred to hear more concerning Colonial decorative stones actually raised, polished, and in the market, and less about certain materials that might fairly be regarded as "museum specimens" only.

THE application of photography to surveying, which is said to have originated with Colonel Laussedet forty-five years ago, has been since further developed on the Continent. The camera is placed on a known spot, the direction of the axis of the object-glass and the focal length of the lens is accurately determined, and the line of the horizon is marked. The photograph taken is laid on a sheet of paper, upon which the direction from the point of observation of all the points in the picture can be plotted. Two photographs of the same object taken from different known points define completely the position of each object, and enable altitudes to be determined. In a recent contribution on this subject by M. E. Monet to the "Mémoires et Compte Rendu" of the Société des Ingéniers Civils there are described and illustrated the types of apparatus used in "photogrammetry"; some being specially arranged for surveying work, while others are adaptations of the ordinary photographic camera. M. Monet has invented a special instrument for determining the altitudes of points appearing on the photograph, by what he calls the "hypnometric rule." The elements for determining the altitude above the horizontal plane of vision are the perpendicular distance of the point in the picture from the horizon and the distance of the point from the place of observation, two photographs taken from different known positions being used.

WE may draw the attention of our readers to the current number of the *Quarterly Review*, which contains three articles that may be of special interest to many of them, viz., one on "The Ordnance Survey," one on "Lost Masterpieces of Greek Sculpture," and one on "The Methods of the New Trades Unionism." The article on the Ordnance Survey is to a considerable extent a defence of the Survey against various criticisms which have been levelled against it lately, and the *Quarterly Review* argues that whatever may be said as to defects—some of them such as ought to be avoided in our set of Ordnance Survey maps—no other country can, on the whole, show anything equal to them. We are inclined to think that the deficiencies which exist are largely due to restriction in the funds expended, and that there is not really money enough and labour enough employed for the task of keeping the maps up to date.

THERE are a great many very dull pictures to be seen at the "Scotland" exhibition at the Grafton Gallery, and even the juxtaposition of a good many of Raeburn's pictures serves to show that the attempts sometimes made to set him up as the equal of Reynolds are not justifiable. He was a fine, solid, and powerful portrait painter, but he has not the variety of Reynolds or Gainsborough, and it is only in a few isolated works that he at all reminds one of Reynolds's inspiration in dealing with colour. Among those which do show originality of colour are, for instance, "Lady Mackenzie" (16), and "Mrs. Gregory" (53), which latter, however, looks rather, in general style and pose, like a leaf out of Romney's book, as the charming half-length of "Mrs. Hamilton, of Pencaitland" (144) is a leaf out of Gainsborough's. The light portrait of Mrs. Vere and the dark one of Mrs. Hope (78 and 80) are beautiful works and form an effective contrast. But Raeburn's best powers were shown in his vigorous and characteristic portraits of men, such as that of General Mackenzie Fraser (115), and some others here, in which the strongly-marked Scottish character and vigour of countenance has found a most able interpreter. His "Yellow Boy" (118), a challenge of course to Gainsborough's "Blue Boy," is a woful failure from that point of view. It is interesting to find a good many of the landscapes of Thompson of Duddingston collected here, and curious to think that some of them, at all events, could ever have been seriously regarded as fine landscapes. Others, however, such as "Innerwick Castle" (107), "Loch Scavaig" (100), and "Loch Coruisk" (87) are really fine, though very conventional and restricted in colour. The central cases contain a good many interesting examples of Highland arms and other accoutrements; the number of dagger-sheaths with a knife and fork sheath combined are curiously suggestive of the roving life of their wearers; these, and some of the Ferrara broadswords, with the hacks on both edges telling of arduous cutting and guarding, bring about one an atmosphere of the Waverley Novels. There is some old silver, of which the best examples (artistically) are the more simple ones; see some of those lent by Mr. Murdoch of Capelrig (215). In an adjoining case is the actual whistle—the "whistle of worth"—won by Craigdarroch as the last man of the party sober enough to blow it, on the occasion celebrated in Burns's well-known lines.

THE ARCHITECTURAL ASSOCIATION:

BRICKS AND BRICKWORK.

THE ordinary fortnightly meeting of the members of the Architectural Association was held on the 18th inst., at the meeting-room of the Royal Institute of British Architects, 9, Conduit-street, W., Mr. E. W. Mountford, President, occupying the chair.

The minutes of the previous meeting having been read and confirmed, Mr. R. A. S. Macalister was elected a member of the Association.

Mr. F. T. W. Goldsmith, the senior honorary secretary, announced the following donations to the library: "The London Building Act, 1894," presented by Mr. Bernard Dicksee; "Half-Timbered Houses and Carved Oak Furniture of the 16th and 17th Centuries," presented by the A. A. Sketch Book Committee; also a copy of each part of the A. A. Sketch Book, as published by the A. A. Sketch Book Committee. Mr. Goldsmith added that the committee lent a copy of each part for exhibition in the common room as published. The Post Office Directory for 1895 and Whitaker's Almanack had been presented to the common room by Mr. W. G. B. Lewis.

Mr. Banister F. Fletcher, junior honorary secretary, announced that the first spring visit of the Association would take place on Saturday, February 2, to the Church House, Dean's Yard, Westminster, where he thought they would be met by Sir Arthur Blomfield, who would explain the place. Members were asked to meet at the Church House at 3 p.m. A lecture on "Chemistry of Building Materials" would be delivered on Tuesday, January 29, and those who intended to join the class were requested to send in their names as soon as possible.

Mr. John Slater then read the following paper on "Bricks and Brickwork":—

The history of the development of the human dwelling, if worked out thoroughly in a scientific spirit would not only be a subject of the deepest interest to all who have to do with modern buildings, but would clear up many of the knotty points upon which archæologists have never been able to agree. The first rudiments of building were undoubtedly the cutting down and joining together of substantial pieces of timber, and as men grew more expert in the use of their rude implements, simple patterns would be cut in the timber, the repetition of which would form a band of ornament, and we should have the commencement of a timber style of architecture.

In China and Japan such a timber style has survived with the growth of civilisation, and very picturesque results are obtained from the elaborate carvings and decorations with which these buildings were enriched. But, as a rule, with advancing intelligence and manual skill, and with the

discovery of the use of metals, men would not fail to contrast the ephemeral and destructive character of their timber dwellings with the hard, dense, and apparently imperishable nature of the rocks and stones which formed the everlasting hills which they saw around them. And you must remember that, although no means of quarrying then existed—Nature herself is the most efficient quarryman. Water and frost, heat and cold, will in the course of ages break up into manageable sizes the hardest rocks, and I do not think there can be a doubt that the earliest stone buildings were formed of rough pieces of rock picked up haphazard and roughly fitted together, the interstices being filled in with some softer materials, such as clay, earth, or sand. Anyone who has examined the remains of the early British villages which exist in many parts of Cornwall, or the very interesting chapel of St. Piran in that county, which dates from the seventh century, cannot fail to be struck by the fact that, as far as the walls are concerned, the stones had no work on them at all, and were simply brought to the spot just as they were found on the hillside and placed in position as they happened to fit. The probability is that the first enterprising tribesman who built himself a stone dwelling, would run the risk of having it pulled down about his ears by his neighbours for his presumption, but gradually his example would be followed, and we should have the rudiments of a stone architecture.

But in many places as the population increased communities would settle down in districts where no stone existed and where the soil was chiefly of clay. Here the enterprising builder would find no hard material ready for his use, but he would notice how in summer this clay became exceedingly hard when the sun beat down on it, and the ingenious man would one day be struck with the idea that if he could dig up lumps of clay when it was soft, of a size that could easily be carried, and let the sun harden them, he would be able to transport them where he liked and use them to make a house with; and in this you have the first beginning of a brick architecture.

The use of unburnt, sun-dried bricks dates back to a hoary antiquity; they were made and used for all kinds of building in Egypt, Greece, where the palace of Crœsus and that of King Mausolus were thus constructed, Assyria, and Persia, and in hot, sunny countries they are still used to-day. Chopped straw was mixed with the clay in order to give it a consistency, and where very little rain fell, these bricks answered fairly well. In fact, they formed the principal material with which the enormous and elaborate Ninevite and Babylonish palaces were constructed. If not very carefully tempered, these sun-dried bricks soon become very friable; and it is owing to this fact that of the majority of these wonderful cities of the East which we read of in history, nothing now remains but a heap of earth and rubbish. But it is also to the fact that the rubbish appeared absolutely valueless, that we owe some of the most interesting discoveries of recent years. Wherever any old stone buildings existed that became ruinous or deserted, the neighbouring inhabitants invariably used them as a quarry and carried away the stone for their own use; but in Assyria no one ever thought it worth while to cart away crumbling clay and earth. Some few years ago a Frenchman named Botta obtained the requisite permission to excavate one of these huge mounds in the desert, with only a few straggling huts around it. His explorations were continued by M. Victor Place, and the result was most unexpected, and showed that many of our architectural forms and features have a much greater antiquity than any one imagined. One can easily understand that in a clay district it would soon become apparent that artificial heat, such as might be obtained from a cooking-place, hardened the clay and altered its colour, but few can have imagined the use that was made of the knowledge of this property in the clay for the production of decorative effects.

These excavations took place aboult 12 kilomètres from the Tigris, at a little village the modern name of which is Khorsabad, which is on the site of the great palace built by King Sargon. Buried under the *débris* of centuries was found a walled city with fine gateways, the palace itself with a magnificent arched gateway of brick, the voussoirs being carefully moulded to the proper shape and enamelled in various tints, forming a beautiful pattern, and as vivid as if they were lately taken from the kiln. Artificially burnt bricks used for paving, and so hard that when struck they rang like a bell, and the discoverers used them as paving for the floor of their temporary stables; arched covers for sewers formed of radiating bricks accurately moulded, and glazed wall-tiles in profusion were discovered. The sizes of the bricks varied considerably, the paving bricks being about 15½ in. square and 2¼ in. thick, and these were carefully laid in two courses, breaking joint; their colour was a dull red, approaching brown. The arch-bricks in the conduits or sewers were curiously formed, every alternate course having a keystone of peculiar shape, and M. Place's belief is that the intervals were keyed with ordinary unbaked bricks, thus affording, in case of repairs being required, an easy means of entering the sewer. The height of the walls of the palace was about 15 mètres, or 49 ft., and their thickness 5 mètres, while the height of the encircling wall of the city itself was about 23 mètres, and the thickness nearly 8 mètres. The gateways, both of the city and the palace, were of such a kind as one would never have expected, being true arched openings about 14 ft. in width and 21 ft. high, the arches being formed of four rows of bricks very carefully laid, with raidiating joints. It is a most extraordinary thing to find these old Assyrian builders planning and executing so fine a work as this. There is one peculiarity about these glazed bricks: although their colour was perfect and the bricks themselves uninjured, they were comparatively soft, and the part built into the wall could be dented by the mere pressure of the hand.

Although, as I have stated, bricks were used in Greece, yet the abundance of excellent marble in that country prevented builders having recourse to an artificial material. In Rome, however, and her colonies brick was extensively used, although recent investigations have shown that many of the old Roman buildings which were supposed to be erected of solid brick are really only brick-faced, and that the interior of the walls is concrete of the most admirable kind. Apart from this, however, there can be no doubt the Romans were excellent brickmakers, as is evidenced by the present condition of many buildings which were erected in various parts of Europe and this country during the Roman occupation. Take the Basilica at Trèves, for instance, nearly the whole of one side of which is the original brickwork, as well as the lofty arch between the apse and the main body of the building, and if you examine it carefully you will see that there was no scamping in that work. The excellence of Roman bricks is further shown by the fact that in many parts of this country what are undoubtedly Roman bricks that have been taken from some vanished building and re-used in other places are still found in an unimpaired condition of strength. St. Albans Abbey may be mentioned, where such bricks occur in large quantities, Dover Castle, and many other places. It may be interesting to notice the size of Roman bricks, which are chiefly remarkable for their length and thinness. Vitruvius enumerates three kinds of bricks: the pentadoron, 14½ in. square and 1¼ in. thick; the tetradoron, 11½ in. square and 1¼ in. thick; and the didoron, 8½ in. × 5 in. × 1¾ in.; the two former being used chiefly in Greek buildings, and the latter in the Roman buildings of his time. The size of Roman bricks varies considerably: at St. Albans they are found 18 in. × 12 in. × 1¾ in., in the old London Wall 17½ in. × 11¾ in. × 1¼ in., while I myself have measured some in Colchester Castle about 15 in. long and barely 1 in. thick. After the close of the Roman dominion, brickmaking, as well as nearly all other arts and sciences, fell into decay, and it is a curious fact that, whether in the British Isles or on the Continent, we have very few remains of any brickwork that is not Roman until about the thirteenth century. St. Sernin, at Toulouse, a church of the twelfth century, is partially built of brick, but the convent of the Jacobins at Toulouse, dating from the end of the thirteenth century, is one of the finest examples of brick building in the Middle Ages. As Viollet-le-Duc points out, it is in this part of France that good building stone is entirely wanting, and consequently the architects of the time were compelled to elaborate a style of their own in the only available material, brick. In the thirteenth, fourteenth, and fifteenth centuries French bricks were of large size, about 13 in. × 9¾ in. × 2¼ in., and the mortar joints were frequently within a fraction of an inch as thick as the bricks themselves. Moulded bricks are but rarely met with, but cut brickwork of very interesting character is found much oftener. It is clear to my mind that Viollet-le-Duc, with all his wide knowledge and versatility, held brick architecture in somewhat low estimation, for two pages in his Dictionnaire dispose of the subject.

In Germany you will find brick largely used in those districts where stone is poor and scarce, but the general mode of treatment in that country is somewhat heavy and uninteresting. There are, however, many fine examples. The Marien Kirche at Lübeck, dating from the end of the thirteenth century, is one of the best specimens of German brick architecture, and this church had a great influence on the style of the surrounding parts of the country. At Brandenburg on the Havel is the fine church of St. Catherine, late fourteenth century, which has one of the most elaborately ornamented exteriors of any brick edifice. I have some diagrams of characteristic German brickwork. One is a gable from Thorn, which is an old fortified town in North-East Germany, on the Vistula. Another is a window from a church at Dobrilugk, a small town on the line from Berlin to Dresden; the third is a mullion of one of the windows of the church of Saints Mary and Nicholas at Frankfort-on-the-Oder. At Preslau on the Uckersee is the very fine Gothic church of St. Mary, dating from 1340, but now restored; and there is one from Seebausen. I have noticed one peculiarity in modern brick buildings in Germany, which is this—the joints are left raked out for a depth of about half an inch from the face of the work as if for pointing, but no pointing is inserted. In appearance the effect is not bad, but I should think it must increase the tendency of wet to soak through the walls.

In Spain—my acquaintance with which country is as yet, I regret to say, confined to second-hand knowledge—brick was used extensively and effectively in the Middle Ages, though in a manner quite distinct from that which prevailed in other parts of Europe. Mr. Street has little doubt that by far the larger part of the brickwork in Spain was done by Moorish workmen, who retained their old constructive traditions. The special peculiarity of Spanish brickwork seems to be that it was rarely moulded, and effect was obtained by simple projections, as at Zaragoza, where patterns are formed by setting forward the bricks forming the outlines from one and a half to two inches beyond the general face of the wall and filling up the spaces with a diaper of small tiles. All the Spanish bricks are narrow—a little over one and a half inch thick—and the mortar joints are half an inch thick. The Torre Nueva, in the same city, used to be one of the very finest specimens of brick architecture, octagonal on plan and the faces covered with diapers; but, unfortunately, as you are probably aware, this most interesting relic of the Middle Ages has very recently been taken down because of its leaning so much out of the perpendicular. At Toledo the churches of San Roman and Santa Magdalena are excellent examples of the simple and proper use of brickwork. One of the diagrams shows the campanile of this church. The construction is rubble stone with string-courses and quoins of bricks perfectly square and with very thick mortar joints. As I have for some time had a great distaste for what is called gauged brickwork, where the bricks are rubbed down and set in putty with as fine a joint as can be made, Mr. Street's opinion on the effect of these thick joints is gratifying as well as interesting. He says of Santa Magdalena:—"The bricks are used very roughly and picturesquely, with a very thick mortar joint, and the consequence is that every part of this work has a value in texture and light and shade undreamt of by those who have never seen anything but our own smooth, smart, and spiritless modern brick walls, built with bad bricks and no mortar." And he goes on to say, in a note, "I am aware that, in saying this, I blame myself as much as any one else."

The Netherlands are rich in brick buildings, and I know nothing much more interesting than a ramble through the narrow streets of some old Flemish city where each house seems to try and outdo its neighbour in the quaintness and originality of its steep brick gables. Picturesque, however, as these are, they always strike me as somewhat wanting in grace and refinement. They are the honest and often successful efforts to escape from monotony of a somewhat rough and uncouth race, whose exuberant genius was unrestrained by any knowledge of or love for proportion such as is shown in classic architecture. The general effect is quite charming, and we, who are accustomed, in the majority of our English cities, to the horrible monotony of a straight skyline formed by a parapet which completely conceals the roofs, can readily forgive the quaint fancy which ran riot in these stepped gables, but the detail is often unsatisfactory, and it is not till we visit North and Central Italy, where the Roman genius and classic traditions had lingered longest, and where the strength of the Northern Gothic was restrained and curbed by the Southern ove of colour and

refinement, that we find the highest development of a brick style in architecture, and an examination of these buildings will, I think, effectively dispel the notion which some people used to be so fond of holding, that brick is a vulgar and inferior material, unfit for use in a large monumental edifice. Street's volume on "Brick and Marble in North Italy" came nearly forty years ago as a revelation to many, and the swing of the pendulum which, during the last few years, has sent Gothic art out of fashion and has brought to the fore a style which, with all its merits, appears to me to carry in itself the seeds of its downfall and decline as surely now as at the time of its first inception, in that lack of reserve and striving after the *outré* and the fantastic which speedily swamped what was true and good and beautiful in the Renaissance, and led to all the monstrosities of the *rococo*—this late rebound, I say, may very probably have prevented the student of the present day from giving that attention to the Gothic architecture of North Italy which it well deserves. Personally, I know of no more delightful field of study, and can only regret that circumstances have not allowed me to visit it more frequently. The lovely variety of tint of the mingled brick and stonework, the juxtaposition of the circular and pointed arch, and, above all, the charming simplicity with which the most beautiful effects are produced, all combine to make the brick architecture of this district unequalled in attractiveness.

Take Verona, for instance—the city which lives in my recollection as the most picturesque in its surroundings and the most interesting in its buildings of any that I have ever visited. The first thing that strikes the eye here is the noble campanile which rises from the group of buildings at the corner of the Piazza dei Signori to a height of nearly 320 ft., though its lower part is concealed by surrounding buildings. It is built at first in alternate courses of brick and stone and then wholly of bricks. For more than half its height it is quite plain, entirely without buttresses, and pierced by three or four small openings only, and then there is a belfry stage, above which is an octagonal story of later date. The belfry windows are contained under a large pointed arch, and are divided into three lights, with coupled marble columns, the voussoirs of the arches being alternately of brick and stone. Verona is absolutely full of objects of interest, but I can only mention a few as illustrating my subject. The cloisters of the Church of San Zeno are, to my mind, some of the most beautiful I have seen. The arches are of brick pointed on two sides of the quadrangle and round on the other two, and on one side is a small projecting arcade; they are without mouldings, and are supported on coupled columns of red marble.

The arcading of San Fermo Maggiore may also be mentioned; and strolling along the narrow streets of the city numerous interesting bits of brickwork will be discovered. There is one special characteristic of the treatment of brick and stone in Verona, namely, the introduction of narrow courses of bricks between the arch stones and the plain walling, or between two rings of voussoirs. This serves to accentuate the arch and to keep it distinct from the main body of the wall, and is an effect that might well be imitated in our own buildings. Venice, which, of course, has a charm all its own, is not very rich in examples of brickwork—or rather, perhaps, I should say that the examples are not of such excellence as in other Italian cities. The church of the Frari is one of the most interesting examples, and there are one or two early campaniles in brick, San Giacomo del Rialto being the best. San Giovanni e Paolo, or Zanipolo as it is called, has an elaborate cornice. It would be both easy and interesting to devote some time to the description of other Italian cities, such as Brescia, Mantua, and especially Cremona, but these would almost demand an evening for themselves; but there is one Italian city which must not be passed over, as it is built entirely of brick—I mean Bologna. The first view of its heavily-arcaded streets is undoubtedly somewhat depressing, but the student of brickwork will find any number of most interesting details. The magnificent church of San Petronio is almost entirely of brick, both inside and outside, and is most impressive from its grand proportions and the excessive simplicity of all its details. There can be little doubt that this church exercised considerable influence on Street, as is shown in some of the late churches which he built. But it is for its domestic work that I think Bologna most interesting, as it shows us with how little trouble and expense we can increase the architectural effect of our plain brick buildings. The brick cornices and corbel tables show any amount of variety. With these few and very inadequate remarks I must leave the subject of Italian brickwork, strongly advising everyone who has not yet done so to take the earliest opportunity of making acquaintance with it, or if that is impossible at first hand, to study Street's book on it.

In our own country after the Roman occupation terminated, very little seems to have been done in brick until the fifteenth century, although there is one building—Little Wenham Hall in Suffolk—which dates from the end of the thirteenth century. The bricks here are interspersed with stone and flint courses, and the bricks are of widely different shapes and sizes, and when I visited the building a few years ago with a few architectural friends, we came to the conclusion that it is very probable the bricks were not made purposely for the building. In the Eastern Counties bricks were largely used during the fifteenth and following centuries, one of the finest examples being Layer Marney Hall, Essex, which has been frequently illustrated. Who was the architect of this building is not, I believe, known, but he was certainly a man of considerable ability, and, I am disposed to think, familiar with some of the Italian terra-cotta work, as not only in the main building, but in the outbuildings also, there are several charming little bits of moulded brickwork. Sutton Place, near Guildford, is a beautiful example of brickwork; but here the influence of Italian Renaissance is manifest, and there can be little doubt that Italian workmen were employed on this building. The detail is pure, the ornament refined.

In Queen Anne's reign English brickwork was under the full domination of the Renaissance, and truly wonderful was the result. As far as workmanship goes, it was admirable. Pilasters, cornices, panels, swags, bunches of fruit and baskets, and, in fact, all imaginable detail was formed of cut bricks with an ingenuity and at a cost of labour that almost excites one's pity. I quite admit the charm of some of the older and simpler forms of this style that are met with most frequently in old country towns where age has given a mellowness to the work, and where nature has so often added to the picturesqueness by the creepers which have overgrown the exterior; but of the later developments of the original style and of the modern imitations of it, what can we say? I am aware that I am on somewhat delicate ground here, and I feel perfectly that my own opinion is a mere personal matter and worth no more than any other person's; but I can only say that much of the modern brickwork in imitation of the Queen Anne style fills me with horror and detestation. When I see pilasters tacked on to a front which not only have an exaggerated entasis at their sides, but come bellying out in front like the sails of a ship, they remind one of the fable of the frog and the bull, and the bricks seem swollen with conceit at having attained to a form utterly foreign to their nature. And it is this, rather than the ugliness, which I so strongly object to. Brick is a hard material, moulded and baked in a kiln, and moulded bricks seem to me perfectly legitimate; but surely the original baked surface is the most fitting to resist the weather, and if you go and rub and cut all the surface off, and then give the material a shape and form utterly foreign to its nature, you are completely reversing the practice of the Mediæval builders, who have left us the most magnificent examples of their skill, and who invariably gave to each material they employed the ornamental treatment which it was best fitted to receive. Much of this modern treatment of brickwork seems to me on all fours with, and just as reprehensible as, the practice which prevailed in the early part of the century in London houses, where we find a small porch carried by what appears to be a solid stone column of the Doric order, but which turns out to be constructed of wood bent to a circular shape and kept there with an infinity of trouble. In each case the material has been tortured, and bears on its face the imprint of its suffering. Having now given you a very rapid and incomplete *résumé* of the historical part of my subject I come to the second portion of what I have to say to you this evening, which relates to the actual materials with which our brickwork is constructed.

I do not think it necessary to occupy your time with any detailed account of general brickmaking, as you can get the information from the various text-books which treat of the subject. You know there are two main distinctions in bricks, viz., clamp-burnt bricks and kiln-burnt bricks; in the one case the fuel being mixed with the clay and all being burnt together, of which kind a London stock is an example; and in the other case the brick being formed of the clay, or rather the mixture of clays and sand and other ingredients—because it is quite exceptional to find a clay that of itself will make good bricks—and then being baked in a kiln, of which there are many different sorts. The thorough tempering of the clay, and mixing it well together, are very important points to be attended to. A very large quantity of brick-making machinery is now in use, and a great deal of stuff that years ago would have been quite useless is now ground up and made into bricks, and the heavy machine-pressers give a smooth face to many a brick which is really not at all fit for use in a building, at any rate when exposed to the weather. You will often find that a smooth-faced pressed brick will flake off. I have particularly noticed this in the inferior kinds of white Cambridgeshire bricks and in those made near Hitchin and in that neighbourhood; and the reason is, I believe, that the outer layers of the bricks get more consolidated than the inner ones, and a loss of homogeneity is the result.

The use of glazed bricks in buildings has very largely increased during the last ten years, and as I have myself been using a very large number in a factory which I am building, I took the opportunity last month of going over one of the large Leeds fire-brick works, and a short description of this kind of brick may not be uninteresting to you. The Leeds bed of fire-clay extends for a distance of six or seven miles only, and is associated with a thin seam of coal. The depth at which the clay is found varies from about 100 to 300 ft., and the seams are about 2 ft. 6 in. thick. The following is an average analysis of the material, and in the diagram on which this is shown I have put alongside it the analysis of an ordinary brick clay, that you may compare the two.

	Fire-Clay.		*Ordinary Clay.*
Silica ($Si O_2$)	68·74		49·44
Alumina ($Al_2 O_3$)	18·94		34·26
Oxide of Iron ($Fe_2 O_3$)	1·45		7·74
Lime (Ca O)	0·19		1·48
Magnesia (Mg O)	0·03		1·94
Alkalies	0·05	...	5·14
Water	2·25		
Organic Matter	8·20		

The clay, except where found quite near the surface, is almost as hard as rock, and has to be dug with a pick much in the same way as coal. The clay must be exposed for some time in the air to get thoroughly weathered, and then is sorted in order that all the particles of coal, ironstone, and shale may be removed, as these spoi the brick. The clay is then crushed in a sort of mortar-mill with a perforated bottom, having holes about ⅛ in. diameter. It is then taken to the tempering-pan, where water is mixed with it to bring it to the proper consistency. The tempered clay is then taken to the moulder, who forms the brick, and then it goes to the drying-floors to stiffen. After that it goes to the presser and is very carefully weighed, because if one brick has more clay in it than another, the contraction during burning would be different, and the sizes would not agree. It is then pressed in a small machine worked by hand, and gauged and fettled up, and is soon ready for the dip. There are two kinds of material in which the faces of the bricks intended to be glazed are dipped; the first is called the body, and the other the glaze. Different firms have different recipes for body and glaze, but the materials used for body are Ball clay or blue clay, Cornish stone, flint, china clay, and plaster of Paris, in different quantities. These are calcined and ground to the finest possible trituration, mixed with water, and passed several times through a fine brass-wire sieve, having 120 meshes to the inch. The glaze is made of Cornish stone, felspar, flint, whiting, and plaster of Paris. After being dipped in the body, the brick is left till the shine goes off its face, and is then dipped in the glaze.

The materials which I have mentioned will give only an ivory or white brick; if other tints are required, such substances as oxide of cobalt, green chrome, bichromate of potash, or manganese, are mixed with the glaze. Some stains, however, will not retain their colour in the heat required for a hard glaze, such as red and deep maroon, and in such cases the bricks are enamelled. In this process the enamel colour is mixed with a flux and ground together, and then, when quite dry, an oil formed of turpentine and resin is mixed with it, and the mixture is applied with a flat camel's-hair brush to the surface of the brick, which has already been dipped in body.

The bricks are then ready for burning, the kilns in which they are burnt holding from 18,000 to 20,000 bricks. Various coloured bricks may

be burnt together, and experience shows what position in the kiln is best for the various colours. The glazed face must never be exposed to the flame. The kiln takes roughly about three days to burn and three days to cool, and uses about 25 tons of good coal. The brown salt-glazed bricks are made by simply throwing common salt into the fire when the bricks are burning. I am indebted to the Wortley Fire Clay Company, Leeds, for very kindly supplying me with the information enabling me to give you this short description of glazed-brick manufacture, and they have sent me up specimens of the stuff and the manufactured article.

To return to ordinary bricks. What is a good brick? Speaking generally, the characteristics of a good brick are:—1. Regularity of shape, so that when built into a wall the pressure is equal over its surface. 2. Toughness as opposed to brittleness, *i.e.*, it ought not to snap when broken, but should require two or three hard blows. 3. Clearness of ring when gently knocked against another brick, and not a dull, heavy thud. 4. Homogeneity of surface and texture in the interior, and above all absence of small stones and pebbles or lumps of chalk; and 5, non-porosity, *i.e.*, a slowness in absorbing water. I am very much disposed to think the latter quality the most important, and one that is perhaps least attended to, I mean, of course, with facing bricks. The rate at which a brick—or, for that matter, stone either—absorbs water is a more important element in its goodness than its total absorptive power, because when built in a wall the bricks are exposed only to intermittent wettings, and if in testing two samples of brick I were to find that one absorbed 15 per cent. of its volume of water in the course of an hour, while another absorbed 20 per cent., but took four hours to do it, I should prefer the latter. The crushing strength of a brick is an interesting subject of inquiry, but practically you will find it very rare indeed for bricks to be exposed in walls to anything approaching this crushing strain. Professor Unwin, at the Central Institution, Kensington, kindly tested some bricks for me a few months ago, and it was found that a Leicester brick was crushed with a load of 245 tons per square foot, a Coventry brick at 217 tons, and a London stock at 125 tons, while a blue Staffordshire brick only cracked under a load of 385 tons per square foot, and could not be broken by the machine. A two-brick wall carried up 102 ft. high, which is of course much higher than would ever be done in practice, would exercise a pressure of five tons per square foot on the lowest course, and this will show you how small is the chance of a brick itself being crushed; but a brick and brickwork are two very different things, the intervention of the mortar-joints introducing an entirely new element. Brick piers are very awkward things to experiment upon, and require very special machinery; but some practical experiments upon them have been made in the United States, and you may take it that three tons per square foot in mortar and five tons in cement are about the safe loads that should be placed on brickwork.

A gentleman whom I have not the pleasure of knowing has suggested to the secretary that it would be very instructive if I were to show some specimens of bad bricks, and point out how to find them out. The reason why some bricks in a clamp or kiln are good and others bad—irrespective of their position—is very difficult to understand even by practical brickmakers, but the most eminent firms are quite willing to admit that they do get a number of bad bricks, and one gentleman told me that out of a very large number of burnings his experience would lead him to the conclusion that 30 per cent. on an average were of inferior quality. *What becomes of this 30 per cent.?* One practical point is never to be guided in choice of a brick by colour alone, as it may frequently happen that what looks like an excellent brick may really be as bad as they make them. Knock them together and see how they ring: a bad brick will never ring well, and then break the brick and see its interior. If you see pebbles, or find the interior soft and not of close texture, you may safely condemn the bricks. A number of specimens of bricks were then shown and commented on by Mr. Slater.

Underburning is, I believe, a fruitful cause of inferiority in bricks, as they are then soft and friable; and from my own observation I should say that, if you notice a load of bricks coming on to a job, with a large number of broken ones among them, the chances are that the bulk of the bricks are bad ones, and they should be rejected. This is altogether apart from the risk to the work owing to the temptation to the men to use snap headers. To revert for a moment to the question of porosity. I believe if in an ordinary brick wall you were to pour water on the face at a level of about 6 ft. from the ground, none of it would run down as far as the ground; the water would get absorbed before it reached so far; and this with very fair bricks. It may be of interest to you to know of an easy method of rendering a brick wall almost, if not quite, impervious to water. Wash the surface over with a solution of soft-soap and water, about half-a-pound to a gallon, laid on with a soft brush; and, when that has dried in, apply a solution of alum and water, mixed in the same proportions, and the result will be that you have waterproofed the wall.

It goes without saying that however good your bricks may be you will never get good brickwork unless good mortar is used, and any one who is in the habit of inspecting old houses will have noticed that in nineteen cases out of twenty it is the mortar which has perished and not the bricks. In fact, I believe a good brick is just as good after one hundred years' use as when it was new. I am sure the difficulty which public officers have with the speculating builder lies more frequently with the composition of this than with the bricks. The stuff which the "highly respectable building-man" will endeavour to pass off as sand is of a fearful and wonderful nature. Sometimes he will use sand, but of such a soft, sugary texture, with no sharpness about it, that it is impossible for it to make good mortar. This you can test for yourselves by trying it between your fingers. But I should strongly advise you to look with the greatest suspicion on a heap of brownish grey stuff, which the builder will tell you is road sweepings. I am not saying that in country districts where the roads are mended with granite, if the road-siftings lie in heaps for some months and are carefully washed, you may not obtain a very good building material, but as a rule there is much organic matter in roadsweepings, and it is very easy to mix garden loam with it, which is of course, utterly unsuitable for mortar. Another thing that men will often try to use for mortar, especially for a building which is to take the place of one recently pulled down, is the siftings of the old lime mortar and plaster which has come from the *débris* of the old houses. Sometimes you may spot this unmistakably by the smell, as I myself once did, a heap smelling very strongly of stale smoke from chimneys. As to lime, it is utterly impossible to discuss this question at the fag-end of what I fear has been a terribly long infliction on you—it would take an evening to itself. I can only say I much wish it were more frequently the practice to build with cement-mortar. I am sure that cement and good sand mixed 5 and 1 would make better work than ordinary lime and sand mixed 3 and 1, and the extra cost would not be very great. There is one thing that you should be on your guard against in country districts—never allow any brickwork to be built in chalk-lime mortar. It never sets in the interior of the joints. As to the joints, except in winter, I should always prefer to have the joints struck as the work goes up, rather than raking them out and pointing afterwards. There is always the risk of not raking the joints out far enough, and the chances are that the pointing will not adhere to the mortar in which the bricks are laid. Whether you have a struck joint or a pointed one, insist upon having it cut in at the top of the joint, and not at the bottom. The men will always do this if they are explicitly told to, but if not they will always cut it in at the bottom, why, I have never been able to understand, giving a lip on which the water collects. In hot weather you must be careful to dip the bricks in water before laying them, or they will absorb the water out of the mortar far too quickly, and prevent it setting properly.

And now, gentlemen, one word in conclusion. In this country it can very rarely fall to our lot to be allowed to carry out a commission under these ideal conditions to which Mr. Brydon so humourously alluded last Monday evening in this room, when criticising the students' work at the Institure, viz., where cost is no object. Economy and utilitarianism are the conditions under which much of our work has to be carried out. We must often, therefore, be compelled to give up the use of stone and to fall back on brick. But do not let us on that account despise our material. It is a good honest material, which lends itself to an inexpensive decorative treatment of a perfectly legitimate kind, and I can only hope that in this short paper—the deficiencies of which I am fully conscious of—I may have given you some reasons for not neglecting the study of the history of brick in the past, and I am confident that such a study will be productive of nothing but good in its results on the brick architecture which you will have to construct in the future.

The Chairman, in inviting discussion, called upon Mr. Clement Broad, the senior partner of the firm who had kindly lent the bricks which had been exhibited.

Mr. Broad said brickmakers had very great difficulty sometimes in supplying bricks to meet the requirements of architects, and he found there were some architects who really hardly knew what was a stock brick from a manufacturer's point of view. Stock bricks represented bulk, and varied very much; some were soft and others hard, while some were more or less rough. If, then, they wanted one particular kind they should specify it. He had seen some builders placed in great difficulty through an architect specifying selected stocks to be used in one part of a building and picked stocks in another part of the same building. The root of all the difficulty was the excessive competition prevailing. The moment a contract was signed a builder had to set to work to get the cheapest thing in the market, which was very natural. He was sometimes asked why he did not make as good bricks as those made one hundred years ago. Well, just as good bricks were made, but with the excessive competition of the present day they could not expect the best article to be commonly used.

Mr. H. W. Pratt remarked that from both a practical and a historical point of view, Mr. Salter had given them an interesting paper. It was getting on for twenty years ago that he was in Verona and other cities in the North of Italy, but he had the most distinct recollection of the beautiful brickwork to which that gentleman had referred. The beautiful forms and detail, and the great preservation of this brickwork through several centuries, had made a marked impression upon his mind. He was in doubt as to some of the brickwork which he saw, whether it was moulded or cut. He fancied it was moulded, but Mr. Slater had referred to some old work which was cut—he presumed he meant cut after it had been placed into position, just as they might cut and carve brickwork nowadays. His recollection of ancient brickwork was that none of it was pointed and built with the fine joints seen nowadays, called, he believed, gauged brickwork. The probability was that if it had been built in that way it would not have lasted till the present day. There was no doubt it was the quality of the mortar used in bygone days that had preserved the work. It had struck him that the better the brick that was used for the inside walls of a building, the more distinct was the sound which was conveyed from one apartment to another, and he wished to know what was the best brick for use in internal and party-walls, so as to prevent such transmission of sound. His experience coincided with that of the lecturer as to the mortar-joint and the way it should be weathered. Bricklayers who habitually did what Mr. Slater condemned in this direction could give no reason for it, and unless well looked after they were apt to exaggerate the weathering, the consequence being that, although they used a good brick, the work had a bad appearance. Having expressed his agreement with what Mr. Slater had said as to the flaking of machine-pressed bricks, Mr. Pratt proposed a hearty vote of thanks to that gentleman for his paper.

Mr. F. T. W. Miller said it was not remarkable that the use of bricks in past times in the North of Italy, in Spain, and elsewhere, had resulted in such charming specimens of architecture, but it was rather odd that no new characteristic seemed to have been developed, and that the old Gothic forms had been so generally followed. He thought that in a great measure the charm of these buildings lay as much in the picturesque localities and people, and the beautiful air, as in the buildings themselves, that visitors were thus influenced unconsciously, and that had the same structures been reared in smoky, grubby, dirty England, they might not have been more noticed than the rest. It was all very well to go in for good brickwork—moulded work, &c.—but the thought was always before his mind when he saw such work that it was very much like a trade catalogue. He thought there was a dignity, simplicity, and sobriety about the early Georgian brickwork. He wished to ask Mr. Slater whether he knew of experiments having ever been made as to the relative strength of the bricks at present made and the larger Roman shapes, not merely the crushing strength on the one selected brick, but on the whole bulk of the brickwork. It seemed to him that the old shapes would be very much stronger than the modern ones, and that they would better stand the test of time.

Mr. Owen Fleming inquired what became of the 30 per cent. of bad bricks. They must be sold, but to whom? They knew that the weight-bearing power of a wall was very much in excess of what was likely to be put on it, and he would therefore ask whether it was absolutely necessary to use a best stock brick for the interior of walls? and he suggested that they might use for this purpose some of the bricks which, though not the very best hard stocks, were honestly produced. With reference to ornamental work, in his opinion it was exceedingly difficult to produce anything that was satisfactory if they once began to touch a moulded brick. The best course to follow was to erect their buildings with plain, square masses of brickwork which were honest and dignified; he was sure they would make a mistake if they went into fancy work. He wished to ask Mr. Slater if he had ever seen in the market a white brick with about the same surface as the ordinary red. The speaker referred to the difficulties experienced in condemning bricks, and suggested that in dealing with builders they should select on the brickfield the brick they wanted used, and then hand it to the builder. This was what he had done, and it had put an end to much bother. Notwithstanding the Luton brick that had been exhibited, he was bound to say he had had some excellent bricks from that part of the country; another good brick was obtained from Crowboro'.

Mr. Broad, supplementing his previous remarks, stated that bricks, in making, were divided into: shuffs, which Mr. Slater had shown did not ring; place, unburnt bricks used sometimes for building country cottages; grizzles, to a certain extent underburnt, but which, he maintained, might fairly be used for inside work in London; then came stocks, and afterwards a better selection, including shippers, paviors, malm-facings, and cutters. The 30 per cent. of inferior bricks were used principally by speculative builders. That was the only market for inferior bricks. As regarded disintegration, he had been watching lately to find the case of a fair stock having gone wrong, but he had been unable to discover one. But he could point out several London buildings where Midland pressed and machine-made bricks were now in a state of disintegration. In reply to Mr. Fleming, he would mention the Suffolk white brick, which was sand-faced; he believed it was the Grosvenor Hotel, near Victoria Station, which was built with these.

Mr. S. B. Beale wished to know why *shippers*, which were better bricks than *stocks*, were always sent out of the country? He understood they were put in ships as ballast. If that were so, why could not stocks or chuffs be sent instead, and the better bricks used to make better work? The flaking of pressed bricks might be caused by the expansion of moisture in the soft part of the interior of the brick; on the other hand it might be due to the bricks not having been properly dried before burning. The ringing test was not absolutely conclusive, nor was it always to be relied upon. The ring should be taken in conjunction with the weight, absorption, and homogeneity. In further remarks the speaker suggested that the bricks now exhibited should form the nucleus of a museum of building materials for the Association.

Mr. J. C. Stockdale, referring to the size of bricks, contended that the most satisfactory facings were obtained by the use of thin bricks. In the Midlands, he said, larger ones were used than in the home counties, and they were very ugly. Mr. Slater had told them that much of the modern work was unsatisfactory because it was so neat, but he (Mr. Stockdale) would point out that it was a very great point in specifications that the work should be neat. He attributed the flaking of the machine-made brick to the unvarying pressure which it received in the process of making; to his mind the machine certainly produced an undesirably smooth face, and an absence of that "texture" only found at present in hand-made bricks, and which was so very important. He considered that salt glazed-bricks were more satisfactory than a more expensive glazed brick, especially when used for external work; they could get a variation in colour in salt-glazed bricks which they could not get in others.

Mr. Garbutt stated that machine-made bricks were pressed in metal moulds, which, he understood, were oiled in order that the bricks might the more readily leave them. That caused a skin considerably harder than the interior of the brick, and this skin sometimes peeled off.

Mr. Goldsmith, dealing with the general treatment of brickwork in an elevation, said he agreed with the speaker who had remarked that he did not think much of the carved work which he saw on buildings round him. In Haarlem, Leyden, and other places in Holland he had seen houses the brickwork of which seemed to him to be almost perfect. There were houses there which had no carving or mouldings whatever, and yet architecturally and artistically the elevations were perfectly satisfactory, and could scarcely be expected to be carried out in any other material than brick. It had been suggested that an architect should select his own sample of bricks on the brickfield. This was an excellent idea, and if they kept such samples in their office and distinctly specified that such were to be used builders would cease sending rotten bricks into the office in the vain hope that in the pressure of business an inferior article would be passed. He had never seen a perfectly-satisfactory white glazed brick, and would like to know if it were possible to keep a glazed brick that, if properly laid, would not crack on the edges or down the surface of the glaze. He also wished to know what Mr. Broad thought of the opalite glazed brick. Having expressed concurrence in the idea of starting a museum of building materials with the bricks exhibited, the speaker suggested that thanks should also be accorded to Mr. Broad for sending the samples.

The Chairman said that Mr. Slater rather objected to rubbed brickwork, but in his opinion, apart from its appearance, which spoke for itself, it was excellent on account of its durability. The best way of pointing besides those mentioned, was, that each brick should be pointed as it was laid, by the trowel. The reason machine-made bricks flaked was because pressure was applied to the outside of the brick, thus forming a skin. If wet got through to the back of the skin, and frost came, the skin came off. Another reason was that the clay was not always properly washed, and lime which had been left swelled, forcing off pieces of the face. In his opinion the best bricks to use to prevent the conveyance of sound were Lindsey's tubular bricks, which were not expensive but were fairly sound-proof.

The vote of thanks having been passed with acclamation,

Mr. Slater, in reply, observed that the question of sound was a difficult one. It was perfectly true that the more solidly they built a house, the more they got the sound penetrating from floor to floor. The damage to machine-made bricks might be done in the drying, but as a matter of fact it was due to the pressing. The clay being partially liquid at the time of the brick being pressed, the outer surface got very hard, and prevented the moisture from coming out during the drying process, flaking being the ultimate result. Flettons were good bricks, but he did not like them for external work. Again, he could not help thinking that an ordinary stock brick was far better for inside work when they were going to put plaster over it, because the surface was not so smooth as in the case of Flettons. He had seen some beautiful specimens of rubbed brickwork which were erected 180 or 190 years ago, but in his paper he was referring to that which had been put up in London within the last few years, and which, he thought, was carrying rubbed brickwork too far. He had Arlsley bricks there, and Mr. Broad had mentioned Suffolk white bricks; the latter, however, he did not like, as they seemed to be too hard and to have too little texture about them when put into house-fronts.

The meeting then terminated.

ARCHITECTURAL ASSOCIATION. — DISCUSSION SECTION.—The fifth meeting of the session of the Discussion Section of the Architectural Association was held on the 23rd inst., at 56, Great Marlborough-street. Mr. H. A. Satchell, A.R.I.B.A., occupied the chair, and a very practical paper on the "Warming and Ventilation of Public Buildings," was read by Mr. R. Henry Weymouth, A.R.I.B.A. The discussion was opened by Mr. Brodie, and sustained by Messrs. Taylor, Stockdale, Simpson, Henderson, Vernon, Dodd, and Clarke. The special Visitor, Mr. J. Osborne Smith, summed up the discussion.

THE COMMISSION OF SEWERS.—On Tuesday the retiring Chairman of the Commission of Sewers, Mr. Alderman Bell, at the ordinary meeting of the Commissioners, enumerated the principal improvements which had been effected in the City of London during his year of office, which included those in Upper Thames-street, Basinghall-street, Widegate-street, Fenchurch-street, and Bloomfield-street. The low rate of mortality in the City proved the good sanitary condition of the City, and in spite of the difficulty of maintaining at the highest standard of cleanliness streets traversed daily by a million pedestrians and 90,000 vehicles, that task had been successfully accomplished.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, at the County Hall, Spring Gardens, Sir John Hutton, Chairman, presiding.

Dangerous and Neglected Structures Expenses.—The first paragraph of the Building Act Committee was as follows, the recommendations being agreed to:—

"We are advised that it is necessary that the Council should give to Mr. Bevan, of the Comptroller's department, a fresh authority to recover dangerous and neglected structures expenses under the London Building Act, 1894, as the authority given to him, and upon which he has hitherto acted, under the now repealed Building Act of 1855, is no longer of any effect. We recommend—

'(*a*) That Mr. Norman Bevan, of the Comptroller's department, be authorised to sue for and recover on behalf of the Council any sum or sums of money due from or payable by any persons to the Council for expenses and costs incurred by the Council in respect of any dangerous or neglected structure under Part IX. of the London Building Act, 1894.

(*b*) That the solicitor do prepare a form of authority in accordance with the above resolution, and that the seal of the Council be affixed thereto.'"

The Teaching of Art.—The Technical Education Board brought up a report in regard to the proceedings of the Board, from which we extract the following in reference to the teaching of art:—

"The most important step taken by the Board in this department has been the appointment of two inspectors of the Art Classes and Schools of Art in receipt of aid from the Board. For this appointment applications were received from 166 candidates, whose claims were considered by the Science, Art, and Technology Sub-Committee. Of these twenty-eight were selected for special consideration, and of these five were invited to meet the sub-committee. Ultimately, on the unanimous recommendation of the sub-committee, the Board appointed Mr. George J. Frampton, A.R.A., and Mr. William Richard Lethaby as joint inspectors at a salary of 300*l.* per annum each, and it was arranged that, in addition to inspecting and reporting upon the various Art Schools and Classes receiving or asking aid from the Board, the inspectors should advise the Board in all matters relating to art teaching, should assist in the conduct of examinations for Art Scholarships and Exhibitions, and in procuring casts and other art objects for the use of the London schools, and, if required, should undertake normal classes for art teachers. Both Mr. Frampton and Mr. Lethaby have for many years been intimately connected with art industries, at several of which they have themselves worked. Mr. Frampton served an apprenticeship as a stonemason, and Mr. Lethaby was for many years first assistant to Mr. Norman Shaw, and is now in professional practice on his own account as an architect and decorative designer. From the Schools of Art and Art Classes which the Board has aided, reports show a great advance during the year, both in the extent and in the character of their work. The application of art to various manufacturing processes is now much more extensively taught than heretofore, whilst the whole work of the schools is becoming more thorough and practical."

The Council adjourned at seven o'clock, after transacting other business of no special importance to our readers.

ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—At a sessional meeting of this Association, held at their meeting-room, Art Gallery, Newcastle, on the 16th inst., Mr. F. W. Rich, of Newcastle, delivered a lecture entitled "The Buildings on the Acropolis, with some notes on the Sculpture." The President of the Association, Mr. Jos. Oswald, F.R.I.B.A., was in the chair. The lecturer was assisted with limelight illustrations by the hon. treasurer, Mr. J. T. Cackett, F.R.I.B.A.

EDINBURGH CORPORATION ART GALLERIES.—Sir John Stirling Maxwell, Bart., of Pollok, delivered a lecture in the Corporation Art Galleries recently on the subject of "Scottish Architecture." The lecture was one of the Corporation art series. The lecturer said that the earliest buildings they had to notice were churches, although they were much less distinctively Scottish than their domestic buildings. The Norman Conquest did not extend to Scotland, but Malcolm Canmore and his successors welcomed Norman and Saxon immigrants in such numbers that this country shared all the advantages of the Conquest without any of its oppressions. This was the great church-building period all over Europe, and Scotland was not behind other countries. Nearly all the Episcopal sees and great religious houses were founded at this time. Holyrood, Melrose,

Kelso, Jedburgh, and many others owed their existence to the generosity of David I. After 1236 there was an architectural hiatus of a century, in which gap the church of St. Monance, in Fife, stood nearly alone. After 1424 a number of Collegiate churches were built; and later on they saw the French influence in such buildings as Trinity College Church in Edinburgh—a church which had been swept away by the North British Railway Company to make room for the Waverley Station. Rosslyn Chapel and St. Giles', with its crown steeple, and one or two Gothic churches were next alluded to, before reference was made to the domestic buildings. The earliest castles they had in Scotland were of the thirteenth century, and Bothwell Castle, Mearns Castle, Rothesay Castle, and Borthwick Castle — the latter with the most majestic fireplace in Scotland — were touched upon and their special features pointed out. Building revived in Scotland under James I., and the Reformation helped to account for the very large number of houses which were built at this time. The castles of this period afforded the commonly-accepted type of Scottish architecture. Maybole was a good example of the so-called "L" plan, and Castle Fraser was an example of the "Z" plan. Fyvie was a later example of the Scottish style, and was the most imposing castle in Scotland still inhabited; but it showed signs of the invading Renaissance. When they looked at Argyll's Lodging in Stirling, built thirty years after Fyvie, the extravagant turrets and corbellings were all gone. The roof and gables had reasserted themselves. This was a beautiful type of a large town house, and was the type which held out the best future for a national architecture in Scotland. Heriot's Hospital gave them some notion of the last strange efflorescence which our architecture made at the time when it fell into the stifling embrace of the Renaissance.

GLASGOW ARCHITECTURAL ASSOCIATION.—At a meeting of the Glasgow Architectural Association, held on Tuesday evening in the rooms of the Philosophical Society, 207, Bath-street (Mr. A. N. Paterson, President, in the chair), Mr. S. Henbest Capper, architect, Edinburgh, delivered his lecture on "The Monks and their Abbeys in Olden Days." On the motion of Mr. William Conner, vice-president, a vote of thanks was cordially given to the lecturer.

ENGINEERING SOCIETIES.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—A paper was read at the ordinary meeting of the Civil and Mechanical Engineers' Society, on the 17th inst., by Mr. A. Hanssen, C.E., on "Checking Engineering Calculations." In it he dealt with the necessity of systematically carrying out the work, and the advantage of using mechanical aids, more particularly alluding to the slide-rule, calculating machines, and various forms of planimeters, A discussion ensued, and after the usual vote of thanks to the author, the meeting was adjourned.

INSTITUTION OF CIVIL ENGINEERS: MANCHESTER ASSOCIATION OF STUDENTS.—At a recent meeting of this Association, Mr. R. H. Clayton read a paper on "Mortars and Cements as applied to Structures." It was a matter of regret, the author said, that no concise and thorough information existed as to the classification and locality of good limestones in this country. Methods of distinguishing the nature of limes by their behaviour under certain tests were described, and instances cited where mortar composed of unslacked lime had seriously injured works by forcing masses of masonry entirely off their beds. Specifications of limes, cements, and aggregates for mortars were given, with the results of various tests referring to the same. The qualities of Portland cement were briefly discussed, and the paper concluded with some remarks on the danger arising from the presence of "free lime" in Portland cements.

THE REPORT ON THE NORTHALLERTON RAILWAY ACCIDENT.—In commenting upon the reports on recent railway accidents last week, we inadvertently attributed that upon the Northallerton disaster to Major Marindin, instead of to Major-General Hutchinson, the inquiry being commenced before the retirement of the last-named officer from the post of Board of Trade Inspector. We notice that the Conference of Railway Companies' Signal Superintendents recently presented General Hutchinson with a silver plate in recognition of the courtesy shown by him to the members of their profession, with whom, of course, he frequently came in contact n his official capacity.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting of this Association, held on the 17th inst., the Chairman, Mr. C. H. Compton, J.P. announced that the Council that afternoon had unanimously elected Mr. George Patrick to the office of honorary secretary, as successor to Mr. E. P. Loftus Brock, F.S.A., who recently succeeded Mr. Allan Wyon, F.S.A., in the treasurership of the Association. The Rev. G. B. Lewis, M.A., exhibited some photographs in further illustration of the very singular double font at Great Toller Church, Dorset, described by him in the current number of the *Journal*. An interesting discussion ensued as to the probable date of the more ancient portion, and the possibility of it having been a Roman altar converted into a font in early Christian days. Mr. Brock, however, pointed out that the font was of Early Norman date, the upper part, of octagonal form, being of the Perpendicular period. Mr. Lewis also exhibited a photograph of a Norman font, discovered some years ago at the bottom of a pond at Whaddon, in Wiltshire, which, on being taken up, was used as the basin of an ornamental fountain in a garden, from which desecration it was rescued by Mr. Lewis, and through his instrumentality was placed in Hilperton Church by the present rector. Mr. Andrew Oliver furnished the following measurements of the font: Extreme outside, 2 ft. 7 in. by 1 ft. 7 in.; inside, 2 ft. by 1 ft. by 4 ft. in height from ground-level. Mr. Oliver also exhibited the upper part of an oak bench-end of the Perpendicular period, having some curious carving, in illustration of the tale of the "Fox and Goose." A description of some recent discoveries on the site of the "White Lion," Bristol, by Dr. Fryer, was read. Mr. W. de Gray Birch, F.S.A., hon. sec., next read a paper "On the Importance of Preserving Welsh MSS.," which evoked considerable discussion.

Illustrations.

GATEWAY, ALBI CATHEDRAL.

THIS gateway is situated at the foot of the external staircase at the south side * of the cathedral of St. Cécile, leading to the flamboyant porch, recently restored by the late M. Abadie.

The porch is probably one of the finest bits of flamboyant work in France, and is far enough south to show a slight influence of Spanish work in detail and general effect.

The effect of the elaborate and delicate detail in dazzling white stone against the severely plain brick of the small round tower on one side, and the main body of the church on the other, seen on a bright sunny day, is wonderful in the extreme, and it gives a picture not easily forgotten. This gateway, with the porch, was erected at the completion of the main fabric in the latter part of the fifteenth and beginning of the sixteenth centuries.

The cathedral itself has a special interest, as being built not only for a church but a fortress as well, and is a fine type of the single-aisled system, with the characteristic planning of the buttresses.

The lower parts of the recesses between the buttresses are occupied by deep windowless chapels, and the upper by long narrow windows, giving, as Ferguson says, a wonderful effect of repose and mysterious gloom.

This character, with its grave simplicity of design throughout, places Albi amongst the finest and most impressive churches in the whole of France.

It took nearly 300 years to build, the foundation being laid in 1282 and the church dedicated in 1476. In plan it is one immense unbroken vault, 55 ft. in width by 262 ft. in length; adding the chapels, 82 ft., its total length is upwards of 300 ft. Internally there is the magnificent choir screen, said to have been erected by a band of travelling German artists; it undoubtedly shows German influence everywhere, with its marvellous and intricate detail and carving.

C. E. MALLOWS.

* The word "north" on the drawing was, we presume, a slip on Mr. Mallows's part while completing the drawing.—ED.

DESIGN FOR MUNICIPAL BUILDINGS, ST. PANCRAS.

THIS design, illustrated in an admirable drawing, was one of the best, in point of exterior architectural treatment at all events, among the numerous designs of very unequal interest which were sent in competition for the St. Pancras Municipal buildings two years ago, when the first premium was given to a design of much more commonplace architectural character, though in some respects of more suitable plan. The design was sent in by Mr. F. H. Tulloch and Mr. Langton Dennis in co-operation.

PALAZZO NOTARI, VENTIMIGLIA, ITALY.

THIS block of building, the drawing of which was exhibited at the Royal Academy last year, was designed to suit the simple requirements of the native population, and is now in course of construction by native methods. The plan and design are by Mr. W. D. Caröe. Owing to recent illness and subsequent absence from town Mr. Caröe has been unable to give us a detailed plan or any further information in regard to the building at present.

SMALL HOUSE, BRENTWOOD.

THIS plan and design for a small country house, which has not yet been carried out, is by Mr. E. A. Hill, and was exhibited at the last Royal Academy. We commented on it in reviewing the architectural drawings at the Academy, and called attention to the graceful treatment of the circular vestibule.

ITTON COURT, MONMOUTHSHIRE.

A VIEW of another portion of this house was given in the *Builder*, May 20, 1893, along with the plan, and some description of the work done in extensive additions to the old buildings, which are of various dates, the only portions of the original building left being, as was then stated, the tower, which was shown in the drawing then published. The drawing given in this number, which was exhibited at the Royal Academy last year, shows a portion of the courtyard from another point of view. Mr. E. Guy Dawber is the architect.

LYCH GATE, MONMOUTHSHIRE.

THIS gate was erected some two years ago. The framing is of English oak, with split oak shingle roof. The architect was Mr. E. Guy Dawber, of London.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A METROPOLITAN district meeting of the members of the Incorporated Association of Municipal and County Engineers was held in the Lecture-room of the Institution of Civil Engineers, Westminster, on the 18th inst., to consider the subject of combined drainage and public sewers. Considerable interest is felt in this question by Municipal Engineers by reason of the recent decisions of the Courts in the Halifax and the Lowther Arcade cases. Papers dealing with the question were read by Mr. W. Nisbet Blair, A.M.Inst.C.E., Surveyor to the St. Pancras Vestry, and Mr. R. Godfrey, A.M.Inst.C.E., Surveyor to the King's Norton Rural District Council. Mr. A. M. Fowler, C.E., Manchester, President, occupied the chair.

Mr. W. Nisbet Blair first read a paper on "Private Drains or Public Sewers." He said that probably the majority of them had cases in which a decision had been given which inflicted upon the ratepayers a most serious burden, and which they could only regard as a most inequitable, if not iniquitous, charge upon the public rates. But the practical opinion of engineers and surveyors on this matter went for little when it was opposed by legal decisions, and doubtless they were agreed that it was eminently desirable that an alteration should be made in the law which would render it no longer possible to repeat the decisions given on similar cases to those which had been before the Courts during the last few years. There appeared to be a difficulty as to how Parliament should be approached to bring about this change in legislation. The simplest means, so far as regarded London, would be for the London County Council to bring in a Bill embodying satisfactory clauses, but, unfortunately, the Council having been approached by the Local Authorities of London, was advised not to proceed with the matter. The clauses in the Metropolis Management Acts of 1855 and 1862, which distinguished between a drain and a sewer, define that a combined drain to remain the property and at the liability of the owner must be made under the order of the Vestry or District Board, and it had always been held that the burden of

proof as to this approval or order rested with the Local Authority, so that any combined drain made without notice being given to the Local Authority, or without the submission of any plan—or, in fact, surreptitiously and illegally—became, by virtue of the very illegality of its construction, a sewer, and as such was chargeable upon the public rates. From his experience in St. Pancras he had no doubt there were many thousand such cases in London. An illustration of a case of this kind was that of Moss and the St. Pancras Vestry, which came before one of the Metropolitan Courts in October last. The Vestry's contention was that the pipe passing through the house from the main sewer was a drain, as, though no approval could be traced to the connexion of the two pipes from the adjoining house, it was contended that the connexion was made surreptitiously, and that such an act should not render the Vestry liable to maintain the pipe passing through the house as a public sewer; but as the burden of proof was on the Vestry to show that it did not give its sanction to the laying of the drains, and having failed in that, the summons was dismissed. After citing various cases of combined drainage, Mr. Blair said there was another upon which difference of opinion exists. A branch from a main sewer might receive the drainage from property in more than one occupation, and was consequently a sewer; but a certain distance along its course a junction existed above which the drainage was divided. The question was: were either of the drains to be regarded as sewers? He contended that each was a drain, whereas he was aware that a solicitor had advised that both were sewers. If so, then every soil-pipe which might become connected to a combined drain became a sewer, through passing vertically through a private house. The report of the law officers of the London County Council would afford some interesting study. Those reports suggested that the difficulty in which Local Authorities were placed was due either to their own imperfect comprehension of the law as to drains and sewers, or that their difficulty was due to their own laxity of supervision or neglect in keeping records of combined drains sanctioned by them. There were few who really understood the present difficulties who would not agree that the culpability suggested as resting upon the Local Authorities or their officers for laxity of supervision or system was the cause of the present position of things.

Mr. R. Godfrey then read a paper entitled "Notes on Combined Drainage." He said that under the Metropolitan Management Act, Sec. 250, combined drainage was authorised "with permission," and therefore in the future all combined drains could be kept from becoming sewers; but in the Public Health Act, 1875, amended in 1890, there was no provision of that kind, and therefore the interpretation of the Courts, as focussed by the case Travis *v.* Utley, had a far more serious effect on provincial districts than on Metropolitan Vestries. It appeared to him (Mr. Godfrey) that the cause of the trouble had arisen from a too cursory reading of the definition of the word drain in Sec. 4 of the Public Health Act. "Drain means any drain of and used for the drainage of one building only," or "premises within the same curtilage." The rock on which they had come to grief was the word "curtilage." From the definitions of the word it was clear that the proper use of the word curtilage was that adopted by the judges, and that its application to the boundary of a property containing more than one dwelling was not warranted by the derivations and meaning of the word. The draughtsman of Section 250 of the Metropolitan Management Act seemed to have grasped the position better and provided for the combination of curtilages by permitting a "combined operation under the order of any Vestry or District Board." In the case of the provinces there was no corresponding power given by the Public Health Act, 1875, and Mr. Justice Kay was perfectly right when he said, in the case of the Acton Local Board *v.* Batten, "a drain is a sewer as soon as more than one house has been connected with it." They were thus placed in the position that they must either insist upon every house having a separate drain, at no matter what cost to the owner, or they must accept a drain draining two or more houses as a sewer—a condition of things of which they could not gauge the potentialities. Mr. Godfrey had the exhibited diagrams of the property in the Halifax case, and in that of the Lowther Arcade he said that accepting the fiats of the courts until the Public Health Act was amended so as to sanction a combined operation, the only course open to provincial authorities was to insist upon every house having a separate drain. This course had been adopted at Cardiff, West Bromwich, and by the Kings Norton Rural District Council, while Reading, in its local Act, had obtained the necessary power to order and sanction combined operations. The adoption of this course would lead to some curious networks of drains, especially in the case of terraces of small houses. The light which legal luminaries had cast upon this subject exposed another serious aspect of the case. If the local authority was to be responsible for and maintain a sewer from the main sewer to the inspection chamber, did it not become the duty of the local authority to provide for and lay down that sewer? As the subject was one exercising the minds of all municipal engineers, who were practically unanimous in the view that some alteration in the law was necessary, the Association should, in the interests of the country, generally take the lead in an endeavour to bring such pressure to bear on the Local Government Board as would bring about a speedy revision of the definitions of drain and sewer, and so to relieve the already overburdened ratepayer of an enormous charge which rightly belongs to the property-owner. The lines on which amendments should follow were the sanctioning of "combined operations" and "power to prevent any alterations of drains without notice."

Mr. Lewis Angell, West Ham, said that on the general question of private drains and public sewers they were all agreed. The question was—how is the law to be altered? In West Ham 250 miles of sewers had been put under the control of the Corporation which were simply private drains. For forty-five years combined drainage had been allowed until the whole thing had been upset by a legal decision, and the Local Authority were charged with the duty of clearing the drains of scrubbing-brushes and flannels which found their way there by the carelessness of tenants. He did not think they, as an Association, could do anything in the matter, except to work up their various authorities, Town Councils and Local Boards to take action. He did not think they could approach the Local Government Board; it was a matter of policy and of law, one for the Town Councils and Local Boards, and not for themselves. This he felt so long ago that he moved in his own Council at the beginning of last year, and they sent a very strong representation to the Local Government Board in April. They received an official answer that it should receive attention, and that was all they got. On June 30, he brought the matter again before his Council, and the town clerk was again directed to communicate with the Local Government Board, but they had got nothing more yet. In consequence of this, the letter of the town clerk and a memorandum and document of his (Mr. Angell's), was sent round to 1,100 Corporations and Local Boards; and they received many replies offering to co-operate with West Ham in obtaining an alteration of the law. Then beyond that, the Associations of Municipal Corporations had prepared a Bill to bring in next Session to obtain an alteration of the law. Therefore, he was inclined to think that if they made any representations at all, it should be to the Association of Municipal Corporations.

Mr. H. Percy Boulnois, Liverpool, said he agreed with Mr. Angell that the right body to deal with this question was the Association of Municipal Corporations.

Mr. W. Weaver (Kensington) thought the Metropolis must be taken as distinct from the country at large on this question. The drainage throughout the country had been done in accordance with certain model by-laws framed by the Local Government Board, and therefore the proper power from which to obtain an amendment of the law would be the Local Government Board. But in London the County Council was the authority which controlled this with a multitude of other matters. The Council had been approached, and advised not to proceed with the matter. If this decision of the Courts was allowed to stand, he had no hesitation in saying that 100,000*l.* would be transferred from the pockets of the Local Authority to that of private owners of property. How was the law to be altered? The surveyors of London had a meeting some time ago, when they debated the matter at some length, and arrived at certain conclusions, which had been transmitted to the Council for consideration. The view taken at that meeting was that a drain should be considered a drain until it was proved to be a sewer, and that the onus of proof ought to lie on the property-owner; and that it ought not to lie on the Local Authority to prove that a combined drain was a combined drain and not a sewer, which was beyond the power of the Local Authority to prove, owing to surreptitious drainage in the past. There was a deputation about to go before the County Council—three from each Authority—to seek such an amendment of the law as would remove the absurdity that a pipe which received the drainage of more than one house was a sewer. He thought it would strengthen that deputation if a resolution was arrived at by that meeting advising that certain steps should be taken. It would strengthen the hands of the deputation if it were known at the London County Council that the officers charged with the execution of the work throughout the Metropolis were convinced that if the law remained unaltered, a vast amount of expense would have to be incurred by the Local Authority which ought to be properly borne by private owners of property.

Mr. J. P. Norrington, Lambeth, said that as a Metropolitan surveyor he wished to endorse Mr. Weaver's remarks. He felt that a great deal of inconvenience and expense would fall upon local bodies from the absurd definition of the law which had recently been given by the Judges. He had recently to reconstruct what was called a sewer under old property, which it would have been more proper to condemn as dangerous. The result of having to relay this drain was, that he had to do all the shoring to keep the building up. He left the building safe, but he did not know what might result hereafter. He had had a curious case in his district, showing how a drain might become a sewer. A person submitted the drainage for four houses, each of which was to be drained into the sewers. The plan was approved. The man went away, changed his mind, and drained the houses by a combined operation. The question was whether that would not be a public sewer?

Mr. J. T. Eayrs, West Bromwich, said that some members might go away with the impression from Mr. Godfrey's paper that they insisted upon a drain for every house connected direct with the sewer in the street. The drainage of each house was brought to the side passage, at the head of which a manhole was constructed, and the drainage of each house was connected separately. They acknowledged the drain at the end of the passage up to which all the drains converged as a public sewer.

Mr. T. Walker, Croydon, said that after draining 400 sets of houses into inspection chambers he found there was no difficulty, and no considerable expense thrown upon the builder or the rates. He could not remember an instance where anything had gone wrong. They did not, however, think that the maintenance of these back sewers ought to fall upon them, and they were going to ask to be relieved of them.

Mr. A. D. Greatorex, Sutton, Surrey, said that three years ago his district, which has 3,000 houses, had no drainage at all, and the Board had spent 55,000*l.* in laying down a system of sewers. During the last eighteen months, 1,500 houses had been connected with the sewers, and the system generally adopted was similar to that introduced by Mr. Walker, and in other cases there was a back drain into which all the small houses connected. In a few years they would have miles of these drains at the backs of the houses, which would become public sewers unless the law was altered.

Mr. R. M. Gloyne, Eastbourne, read a draft of the new Bill prepared by the Association of Municipal Corporations to amend the law, and which proposes to make all combined operations private drains, and to give widened powers of entry and examination for officers of local authorities.

Mr. C. H. Cooper said that in his own district there were long lengths of back drainage belonging to different owners, and if notices were served on them to put their own particular part of the drainage right, it was almost impossible for them to do so, as the work ought to be done together, and would be much better done by the Local Authority than by the several owners. In the case of new houses there was no difficulty.

Mr. Worrell, Chief Works Inspector for St. Pancras, said they were all agreed that the remedy for the present position of affairs was Parliamentary interference.

Dr. Sykes contended that from the time these Acts were passed the pipe which carried the sewage of more than one house had been a public sewer. There was a decision as long ago as 1862. It might be very convenient for engineers for administrative purposes to have this arrangement,

but if the public had been building on certain lines he thought it would be unjust to make any Act retrospective and punish them for doing what they were entitled to do.

Mr. Blair and Mr. Godfrey briefly replied to the discussion, and on the motion of Mr. Angell, seconded by Mr. Weaver, it was agreed that a resolution embodying the views of the meeting should be forwarded to the Conference of delegates from the Vestries and District Boards of the Metropolis, held at the Holborn Town Hall, on Monday, the 21st inst., and that copies of the resolution be also forwarded to the London County Council and the Association of Municipal Corporations. The drafting of the resolution was remitted to the Council of the Association.

On the motion of the President votes of thanks were also accorded to the authors for their papers and to the Institution of Civil Engineers for the use of the meeting-room.

Correspondence.

To the Editor of THE BUILDER.

THE NEW DISTRICT COUNCILS AND THE PUBLIC HEALTH ACT.

SIR,—Your Note in the *Builder* of January 19 raises questions which can, I think, be best answered by the aid of the plan of the building which has, as I still venture to think, been illegally sanctioned by the Local Authority at Wimbledon.

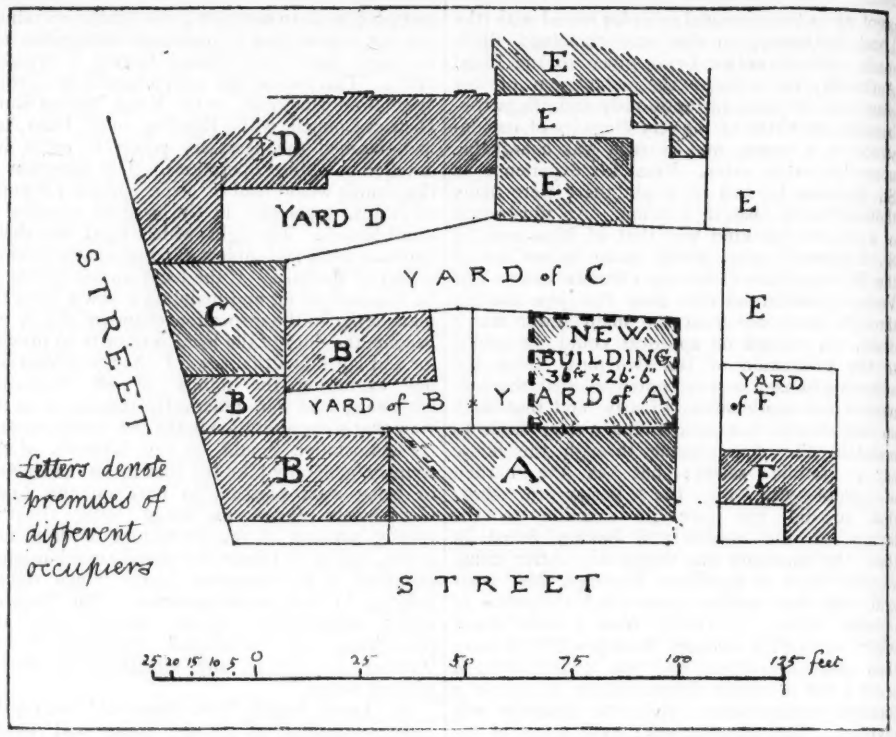
The letters (see plan) A B C D E F distinguish premises of different occupiers. A is an old building, once a range of stabling and coach-houses, built long before Local Boards or Public Health Acts were thought of, and converted some time back into a dwelling-house. It had till a few months ago a sufficiently spacious back-yard, extending behind its whole width. The greater part of this yard has now been covered by the building shown by a dotted line covering nearly 1,000 superficial feet, and containing nearly 16,000 cubic feet. It is further in contemplation to add an upper story to it.

The point at issue is simply this—is this new building exempt from the operation of the by-laws on the ground that it is attached to an old building which is itself exempt? Or is it a "new building" in the sense intended by the Public Health Act, and therefore erected in violation of the by-laws?

It is admitted on all sides that if it is a "new building" in the legal sense, it has been improperly passed by the Local Authority; but that Authority has refused to interfere on the ground that they have no control over additions to old buildings. According to the statement of the Clerk of the Wimbledon Board in his letter to the *Times*, Local Authorities, except in London and towns with a special Act of Parliament, have no power over additions to buildings older than 1858. The owner of a building thirty-seven years old may make any ricketty, inflammable addition to it he pleases with impunity, although it is surrounded by other buildings a few yards distant, and he may disregard all considerations of open space for light and air. At least he may do so at Wimbledon, and now that this is officially stated no doubt it will be done there very freely.

But the Clerk of the Wimbledon Board himself admits that when an addition passes a certain limit it ceases to be an addition, and becomes a new building. What that limit is he declines to say. Each case must be determined by the Local Authority on the facts. So that, after all, we come to this—that it rests with the Board to interfere or not pretty much as it pleases. One Board may reckon any addition, larger than a pantry or a porch, as a new building, and require it to obey the by-laws; another may, as in the present case at Wimbledon, refuse to interfere with the intrusion into a crowded back-yard of a building covering more than half as much ground as the old building to which it is adjacent. Surely if the Board are to do as they please in enforcing the by-laws or not there is an end of their plea that they are powerless to interfere.

But the strangest part of their Clerk's story is his explanation of the fact that though the building was exempt from their jurisdiction the Board received the plans and passed them. We are told that the plans were submitted as a voluntary act by the applicant, and what is more wonderful, that such voluntary acts are not uncommon. That any sane person should voluntarily submit his work to the approval of a Board which has no authority to interfere, and incur fees and tedious formalities from which he is exempt, almost passes belief. Nor do the reasons for this self-sacrifice which he gives in his letter to the *Times*, explain it in the present case. The applicant in question has no need to "ascertain the views of the Local Authority," for he was himself chairman of the Board, and knew as well as them how far the by-laws applied; nor is it likely that, being a builder, he was "glad to get an expert opinion gratuitously."



Your correspondent, Mr. Gibbs, observes what must have struck anyone conversant with the matter, that the Public Health Act seems to avoid defining a "new building." It is much to be desired that the definition he quotes from the Sheffield Corporation Act were generally accepted, and made binding upon Local Authorities throughout the country.

But even then there would still be wanting some ready form of appeal, short of the expense of litigation in a superior court, to force a Local Authority to act by its own rules. Mr. Sewell, in a letter to the *Times* of January 21, tells us how the Reigate Board ignores its own excellent by-laws, and has allowed the construction of a street which violates them, in spite of the protests of the ratepayers. He concludes: "When by-laws necessary for the safety of the public and the protection of the poor are knowingly set aside by Local Authorities, it can only be because the interests of a small class, perhaps owners of a certain kind of house property, are preferred to the advantages of the whole community."

T. G. JACKSON.

*** A letter on the same subject, from "A Town Surveyor," is held over for want of space. —ED.

The Student's Column.

BRICKS AND TERRA-COTTA.—IV.

EARLY HISTORY OF BRICKMAKING.

THE moulding of clay, and the application of the heat of the sun to harden the object moulded, were almost the earliest arts of which we have any record or relic; sun-dried bricks are in common use in certain parts of Asia even at the present time. From this elementary product to a more finished article burnt artificially was but a slight step, so we must not be surprised to learn that both sun-dried and fire-burnt bricks were made by the most ancient nations of which we have any real knowledge. We are distinctly told in Genesis xi., 3, 4, that burnt bricks were made for the erection of the Tower of Babel; that the builders "had brick for stone, and slime had they for mortar." The Chaldeans and Assyrians were acquainted with both kinds of brick, and well understood the firing of clay for terra-cotta. Bricks from ancient Babylon vary in form, size, and colour, some being of long proportions, about a foot in length, and 3 in. to 4 in. thick, others about 1 ft. 6 in. square and of similar thickness; their hues are not unlike our modern red and yellow products. In speaking of the manufacture of these ancient bricks, Herodotus explains how the earth was taken out of a moat, and as the labourers dug this they made bricks of the earth. When they had moulded a sufficient number they baked them in kilns.

Xenophon, in his "Anabasis," Book ii., cap. 4, gives an account of the wall of the Medes. It was built, says he, of burnt bricks laid in asphalte (bitumen), 20 ft. in thickness, 100 ft. high, whilst its length was about 67 miles.

The use of bricks painted in colours, burnt in, was proved by the discoveries of Layard and others at Nimroud, where specimens were found, enamelled in white, yellow, and green. These were apparently embedded in plaster above some alabaster slabs, and were no doubt intended for ornamental purposes.

The Egyptians were well-versed in the art of brickmaking, but many ages elapsed ere they began to use burnt bricks. The use of this material for their buildings was largely dictated by necessity, there being practically no timber in the country fit for building purposes. When the Jews were in Egypt, brickmaking had attained to a very high degree of proficiency. Stubble was used with the silty mud of the Nile in the manufacture of the material, which was burnt and used in many public works. In a monument of the XVIIIth Dynasty we have a representation of the whole process of brickmaking. It was carried out on almost precisely the same lines as with us at the present day, with the exception of firing. The mixing of the clay, the fetching water in a bucket from a pond, the moulding in a wooden mould (with a fixed head wider than the mould itself), the carrying of the bricks suspended to a sort of yoke, and the setting them in order to dry, are depicted in an unmistakable manner. In Egypt there are many small pyramids of unburnt bricks, the latter being formed of loam and chopped straw.

The Greeks made at least three sizes of bricks, which have been well described by Vitruvius; these were the *didoron*, 6 in. in length; *tetradoron*, 12 in. long; and the *pentadoron*, 15 in. long. The two last were square, the first elongated. To each of these they made half-bricks, which gave them the choice of a greater variety of thicknesses for their walls than they would otherwise have had. The same writer states that the Greeks used the *pentadoron* for public and the *tetradoron* for private works; but as to the application of the *didoron* he is silent, as he also is respecting the thicknesses of the bricks. He instances several celebrated structures, as the walls of Athens, the cells of the temples of Jupiter and Hercules, which were of brick, the surrounding columns and entablature being of stone. Nevertheless, it does not appear that the Greeks were great users of bricks, at least, prior to the Roman conquest.

The Romans, however, employed this material very extensively. In his researches amongst the buildings of ancient Rome De Quincy observes

that he found bricks of three sizes:—(1) 7½ in. square by 1½ in. thick; (2) 16½ in. square and from 18 to 20 lines in thickness; (3) 22 in. square by 21 to 22 lines in thickness. The smaller bricks were made to face walls of rubble work; and to make a better bond with the wall, they were cut diagonally into two triangles, the longer side being placed on the outside, and the point towards the interior—the work being bonded by courses of the large square bricks at every 4 ft. in height. The large bricks were also used in arches of openings or discharge, which were necessary in the building. According to Alberti's observations the Romans had in some of their buildings, particularly in arch-work, bricks 2 ft. square; besides a kind used in pavements and borders, that are about 6 in. by 3 in. and 1 in. thick. In Palladio's time bricks were termed *quadrels*, and with regard to their sizes, he says that they may be larger or smaller, according to the nature of the purpose for which they were intended. Some writers state that there was a kind called *tavellæ*, 7 in. by 3½ in.; and that the Romans also had a sort called *bipeda*, two Roman feet in length.

As examples of Roman bricks in England, the following dimensions of some found at Newcastle-on-Tyne may be given:—

Roman Bricks at Newcastle.

1.— 6½ in. × 3¾ in. × 1⅜ in.
2.— 8 ,, × 4 ,, × 1½ ,,
3.— 7 ,, × 6 ,, × 2 ,, (and 1¼ in.)
4.— 7⅜ ,, × 8 ,, × 1½ ,,
5.—10¼ ,, × 10¼ ,, × 1½ ,,

We have abundant evidence of the use of hollow bricks by the ancients; one such, of Roman age, found near the above, measured 11 in. × 7 in. × 6½ in., the material being three-quarters of an inch in thickness. These hollow bricks were made on block moulds, and were employed, amongst other things, as channels for hot air for rooms and baths, though they have been sometimes used for purely constructional purposes. In a Romano-British villa there were found a hearth formed of bricks about 7 in. square; a mosaic pavement, bordered by three rows of black and red tiles, 6 in. square, laid chequerwise, bounded next the wall by a row of bricks 15½ in. by 11 in.; and piers 2 ft. 9 in., in height, and 7½ in. square, consisting of eighteen layers of bricks, with a larger one, 10½ in. square at top and bottom. From the foregoing it is evident that considerable latitude was allowed in the matter of size of Roman bricks, though it should not be forgotten that these bricks refer to several different periods.

It is interesting to learn the way in which the Romans prepared the raw earths and burnt them. Brickmaking had acquired great importance in the days of Vitruvius, and it is but natural that he should have paid some attention to the practice. He gives the following directions for making unburnt bricks. They should not be made of sandy, stony, or gravelly loam, for such kind of earth renders them heavy, and upon being wetted with rain after being laid in a wall they sweat and dissolve, and the straw put in them does not adhere on account of their roughness. The earth of which they are formed should be light, chalky, white, or red; they may possess a small amount of grit or sand, as these are pliable and unite well, and being light, are handled with facility in building. They should not be made in summer, because when dried in the intense heat of that season, they are parched externally, whilst the interior is still rather wet. They ought, therefore, to be made either in the spring or autumn, when they dry more equally; but to ensure their being sufficiently seasoned, Vitruvius remarks it was best not to use them until they had been made two years. At Utica the laws allowed no bricks to be employed before they had lain to dry for five years. Alberti states that the ancients mixed crystalline limestone with the red earth of which they made their bricks; and it appears, in order that the latter might be burnt the better, holes were made in the larger sizes when moulding them. It is probable that at Rome the common houses were generally built of unburnt bricks, whilst the body of nearly all the public buildings was of burnt brick, faced with marble or stone.

We ought not to forget that the ancient Peruvians and Mexicans also extensively employed bricks; a square truncated pyramid, formed of four terraces, near Cholula, for instance, is either built or faced with bricks. The Chinese, of course, knew all about brickmaking; it is almost needless to mention that the Great Wall, built about 200 years B.C., was of burnt bricks.

Turning our attention to bricks manufactured in early times in Britain, we may say that it is generally admitted that the Romans introduced the art of brickmaking into this country; but it does not appear that they preferred brick to stone, as a rule. Indeed, some writers assert that they never used brick unless compelled to do so in the absence of other material, which is not, however, strictly correct, except in a limited sense.

Of Saxon bricks we know very little, but it is tolerably certain that prior to the time of King Alfred few edifices were erected of that material. In the early Saxon period it seems highly probable that they were of practically the same size and shape as the Roman. There is, however, abundant proof that in their later buildings the Saxons made use of Roman bricks; in much the same manner as we in a "more enlightened" age have in several instances made quarries of old Roman roads.

It is generally believed that brick was in disfavour in Norman times and until the reign of Henry VII., when considerable progress was made in brick building. To this, however, there are many exceptions, for Leland tells us that in Richard II.'s time the town of Kingston-on-Hull became very rich, and the then Count of Suffolk had the tower greatly enlarged, the whole was enclosed by ditches, and the wall begun, "and in continuance endyd and made all of brike, as most part of the houses of the town at that time was. In the waul be four principal gates of brike, the north gate having four wardes, between the which and Beverle-gate be twelve tours of bricke, yn one of them a posterne." And Leland goes on to describe at some length various other edifices built of brick. During the time of Edward I. and II. wall-tiles were made after the Flemish manner. The lower part of a wall was generally composed of ragstone, but the upper was faced with brick on the outside, whilst the inside was of soft stone. Other walls were faced with brick on each side, half a brick thick, and the space between filled with rough stones.

About the middle of the sixteenth century, brick buildings were chequered with glazed bricks of a colour darker than the remainder of the face-work, which was mostly of bricks of deep red, hard, and fairly well burnt. Very little need be said concerning the history of bricks of more recent date. We all know of the agitation for the repeal of the tax on them and its results, both in giving great impetus to the spread of the brick-making industry in this country, and in its general effect on architecture.

OBITUARY.

MR. E. G. PALEY, F.R.I.B.A.—We regret to record the death of Mr. Edward Graham Paley, Lancaster, of the firm of Paley, Austin, & Paley. Deceased succumbed to an attack of typhoid fever on the 23rd inst., in his seventy-third year. Born at Easingwold, York, in 1823, Mr. Paley became a pupil of the late Mr. E. Sharpe, Lancaster, in 1838, and partner in 1845. The firm, which has always been distinguished for its attention to ecclesiastical architecture, designed numerous churches, besides additions to Lancaster Castle, and the County Asylum, Lancaster. Mr. Paley was himself responsible for the designs of the Royal Albert Imbecile Asylum, Lancaster, an institution providing a home for nearly 1,000 imbeciles of the six northern counties. He also designed a number of mansions in the North, including Winmarleigh House for the late Lord Winmarleigh, extensions to Holker Hall for the late Duke of Devonshire, mansions for Sir J. Ramsden, Sir Gilbert Greenall, and others. He drew the plans for the principal buildings of the Lancaster Banking Company, for the extensive wagon works at Lancaster, and the jute works at Barrow-in-Furness, and designed the principal stations on the Lancaster and Carlisle section of the London and North-Western Railway, and also on the Furness Railway. The partnership with Mr. H. J. Austin, the surviving principal of the firm, which began in 1868, gave additional prominence to the ecclesiastical branch of architecture—both Mr. Paley and Mr. Austin being the sons of clergymen—and a very large number of churches and places of worship in all parts of the country were from their designs. Amongst works on which he was engaged in Lancaster was the erection of a new infirmary, which, though nearing completion after great efforts to raise the money, he has not lived to see finally completed. Mr. Paley took great interest in archæology, and was one of the founders of the British Archæological Society, which began its existence at Lancaster just over fifty-one years ago.

GENERAL BUILDING NEWS.

RESTORATION OF LITTLE BERKHAMSTEAD CHURCH, HERTS. — The parish church of St. Andrew was, on the 19th inst., reopened after restoration, by the Lord Bishop of St. Albans. The stalls and benches throughout are of carved and moulded English oak, the gift of members of the Wormald family, long resident in the parish. The pulpit, altar-rails, open-timbered south porch, lectern, litany desk, and cross over the roof-beam are all of the same material, being memorial gifts, as is also the altar itself, the offering of neighbouring clergy in memory of Thomas Ken, Bishop of Bath and Wells, who was born in the parish, and whose well-known hymns were used at the services. One memorial window, by Messrs. Lavers & Westlake is fixed, and others are in contemplation. The nave is divided from the aisle by an arcade of two bays in lieu of the former mean post of deal, and the shingle-covered belfry and spire are now carried by massive oak posts direct from the church floor. The floors are covered throughout with wood blocks under the benches, and Godwin's tiles in the sanctuary and all gangways, from special designs. The church is warmed by Mr. de Ridder's method. A double sedilia and piscina have been provided, and, during the progress of the works, the old piscina was found, broken up and inserted in a modern wall, almost identical with the new one. Oak arcaded screens divide vestry and organ chamber from choir and aisle. The general contractor is Mr. B. Wilford, of Newport Pagnell. The carving is by Mr. Hitch, of Vauxhall, and the whole of the works have been carried out from the designs and under the superintendence of Mr. E. Swinfen Harris, of London and Stony Stratford.

BOARD SCHOOL, BEDMINSTER.—A new board school has just been opened in South-street, Bedminster. The school, which is to accommodate 1,400 children, is to be used for three departments—infants, juniors (mixed), and seniors (mixed). There are nineteen class-rooms and three assembly-halls, one for each department. Lavatories, cloak-rooms, and teachers'-rooms are also provided, and the cost is just over 16,000*l.*, which includes furnishing. The building is a two-storied one. The architect was Mr. W. V. Gough, and the builder Mr. Beavan.

OFFICES FOR THE COMMISSIONERS OF SEWERS. —The foundation-stone of the new offices of the City Commissioners of Sewers. which are to be erected on a site in Basinghall-street, adjoining the Guildhall Library, was laid on Tuesday by Mr. Alderman Bell, chairman of the Commission. The plans for the new building, which is to be completed in twelve months at a cost of 32,266*l.*, were prepared by the late Engineer of the Corporation, Colonel Haywood. In the new offices there will be a total floor accommodation of 20,750 ft. super, or 13,000 ft. more than the area of the existing offices. The new court room, which will be on the second floor, will be more than double the size of the present one, and increased accommodation will also be provided for the principal Clerk and his staff, the Engineer and his assistants, the Inspectors of Pavements, &c., besides which suitable offices will be found for the Medical Officer of Health, the Electrical Inspector, the Rate Collectors, and the Sanitary Inspectors. The building will be of fire-proof construction, and a passenger-lift will be provided to all the floors. The builders are Messrs. Chessum & Sons, and Mr. D. J. Ross is the engineer.

RENOVATION OF CATHOLIC CHURCH, HULL.—The St. Charles' Catholic Church, Jarratt-street, Hull, was re-opened on the 20th inst. The interior has almost entirely been remodelled, from the designs of Messrs. Smith, Brodrick, & Lowther, architects, Hull. The main roof of the church has been stripped of the old slates, and entirely re-slated. The flat ceiling has been removed, and the king-post roof so altered that an enriched and panelled coved ceiling now runs the entire height of the church. The walls of the church on the east and west sides have been pierced, and arcades of three bays each now connect the body of the building with the new aisles. These new aisles have been built on the east and west sides. In the west aisle are three carved oak confessionals, recessed in the wall; also a Lady Chapel, with an ornamental fibrous plaster ceiling, in the centre of which is a cupola light, filled with tinted cathedral glass. There is also a shrine of Our Lady of Perpetual Succour, and at the end of this aisle is the Sacred Heart altar. On this side of the church are also the sacristies, which have been considerably enlarged, and are connected with the presbytery by a glass conservatory. The old gallery stairs have been taken away, and there is now a direct exit from the new aisle on the east side. The organ has been removed from the centre of the gallery, and placed in an alcove over the entrance, thus giving greater sitting accommodation for the congregation. The seating in the body of the church has been re-arranged, there being now a centre aisle, leading direct to the sanctuary. The sanctuary itself has been enlarged by the removal of the two side altars, and altering the curve of the communion rails. The contractors are Messrs. Colley & Levett, and the sub-contractor Mr. G. L. Scott, joiner; Mr. Beal, plumber; and Messrs. King & Co., ironmongers. Messrs. George Jackson & Son, of London, have done the whole of the fibrous plaster. The church is now lighted throughout with electricity.

CONSTITUTIONAL CLUB, BOVEY TRACEY, DEVONSHIRE.—On the 17th inst., the foundation-stones

were laid at Bovey Tracey of a new Constitutional Club. The Club is situated in Fore-street, near the centre of the town. The main elevation towards Fore-street will be of red pressed bricks, relieved with buff bricks and cement dressings, the roof being covered with grey slates. On the ground floor is a central entrance, with reading and card-rooms on either side; hall and staircase, with lavatories, &c., and in the wing in the rear, kitchen, and other offices for the use of the caretaker. On the first floor, extending the full length of the frontage to Fore-street, is a large room for meetings, with a projecting balcony from the centre window opening over the main entrance, and in the rear, lavatory and retiring-rooms. On the second floor are a billiard-room, lighted by means of a large lantern light in the roof, and a small committee-room adjoining. The works are being carried out by Messrs. Winsor, Aggett, and Mardon, of Bovey Tracey, from the designs and under the superintendence of Messrs. J. W. Rowell & Son, architects, Newton Abbot.

EMPIRE THEATRE OF VARIETIES FOR SHEFFIELD.—The Empire Palace of Varieties Company, Limited, have let the contracts for the erection of one of their Palace of Varieties in Sheffield, and work will be commenced at once. The building will accommodate 3,000 people. Mr. F. Matcham is the architect.

HOME FOR NURSES, NEW CROSS.—Captain C. Andrew, Chairman of Committees of the Metropolitan Asylums Board, recently opened the new Home for Nurses at the South-Eastern Fever Hospital, New Cross. The establishment is connected with the hospital by a covered way, and contains a large sitting-room, dining-room, and a fine hall and staircase, all floored with polished Austrian oak. Every nurse has a separate bedroom, and upon each landing are presses to hold all clothing worn in the wards. The architect is Mr. John S. Quilter.

BEXLEY HEATH ASYLUM.—The Asylums Committee of the London County Council, at a meeting on Tuesday, appointed Mr. G. T. Hine architect for this hospital. It may be remembered that the committee formerly endeavoured to obtain an architect to carry out the work at a salary of 800*l.* a year, giving up all other work till the completion of the Asylum; an expedient which naturally failed, and which should hardly have been proposed, as it was a very inadequate way of recompensing any competent architect for such work. The committee then obtained powers to select and appoint an experienced architect and give him a fee of 10,000*l.* in lieu of commission and expenses. This condition was advertised, and from among a number of applications six were selected for consideration and were interviewed, and the appointment was finally given to Mr. Hine. The new Asylum is to be for the same number of patients as Claybury—two thousand; and the committee have made a grant of 350,000*l.* as the cost of the building, exclusive of land equipment. It is a pity this course was not taken at first, instead of putting so many architects to inconvenience in regard to the first very ill-judged proposal.

CHURCH SCHOOLS, BARNSTAPLE.—A new Church School was opened at Barnstaple on the 22nd inst. The building is in the Geometrical style. On the ground floor there is a room 45 ft. by 25 ft., which is to be used as an infant school. The school will afford accommodation for 170 infants. There is a large class-room adjoining, and there are kitchen and offices on the same floor. On the first floor there is a parish-room 70 ft. by 25 ft., and 28 ft. high, there being a gallery at the west end. The room will accommodate 500 persons. Adjoining it are a committee-room and a ladies' lavatory. There are two external staircases leading to the parish-room, and there is also an internal staircase. All the rooms are heated by means of hot-water pipes. The building is of Tavistock stone, with dressings of Marwood and Bath stone. The architect was Mr. W. C. Oliver, of Barnstaple, the contractors being Messrs. Garland Bros. (masonry and carpentry), Messrs. Youings & Sons (stonework), Mr. W. Allen (glazing), and Mr. G. Carter (plumbing).

SANITARY AND ENGINEERING NEWS.

SEWERAGE WORKS, SANDBACH.—Colonel C. H. Luard, an Inspector of the Local Government Board, held an inquiry at the Sandbach Town Hall on the 3rd inst. with reference to an application made by the Sandbach District Council for permission to borrow 6,000*l.* for the purpose of carrying out important extensions in connexion with the sewerage of the town and for the provisions of sewage disposal works. The scheme has been prepared by Mr. E. Codling, C.E., of Manchester. The outfall works are to be on the International Company's plan, and will include the new form of circular tank, with provision for the removal of the sludge whilst the tank is in full operation, by means of the Candy sludge removal apparatus. The sewage, after precipitation by means of ferozone, will then be filtered by means of polarite.

MACCLESFIELD SEWAGE DISPOSAL.—An inquiry was held on the 9th inst. by Major-General Crozier, R.E., Inspector to the Local Government Board, to consider an application from the Macclesfield Town Council for sanction to a loan of 60,000*l.* for sewerage and sewage-disposal purposes. Mr. W. H. Radford, C.E., of Nottingham, Engineer to the scheme, gave evidence that the Macclesfield Corporation had obtained a provisional order, and had already purchased 59½ acres of land, below Prestbury, for the sewage disposal. The dry-weather sewage is 800,000 gals. a day, and manufacturers' foul liquids, 200,000 gals., making 1,000,000 gals. a day in all. At present all the sewage is turned into the river, which is black and filthy. The Corporation originally proposed an irrigation scheme, but this had been altered, with the Engineer's approval, to precipitation and land filtration, in consequence of the opposition met with from the land-owners, in order to get a better effluent, and because of the heavy price they would have had to pay for a larger area of land. The sewage will be delivered by gravitation and first clarified in Dortmund tanks, followed by a second clarification process in ordinary rectangular tanks; the effluent will then be filtered through coke beds, and finally filtered through 59½ acres of land. The land will be well drained and laid out with sewage carriers. The mud will be pressed, and all the arrangements will be of the most modern character. The whole of the sewage of the borough will be collected by means of intercepting sewers following the course of the river and tributaries, and will then be conveyed through a 2-ft. outfall-sewer to the disposal works, situated about three miles below Macclesfield. Iron pipes will be used for the large sewers where there is much water. There was some opposition from the County Council, who asked for a special sewer to be laid in Victoria-road for the convenience of the County Asylum. The County Council also asked for a special clause giving them additional powers to control the works passing under Beech Bridge and Prestbury Bridge, but they afterwards withdrew the opposition as to the bridges. Mrs. Legh's representative asked that a storm overflow at Prestbury Bridge should be dispensed with, that there should be no sewer-ventilators near that bridge, and that the sewer at Broken Cross should be deepened. The Macclesfield Rural District Council asked that the sewage of Prestbury should be received into the Macclesfield system. The inspector made appointments to view the district on the following Saturday, and said he would report in due course.

DOVECOTE BRIDGE, WALTON, CUMBERLAND.—The inspection and formal opening of this recently-erected bridge, which spans the River King at the ford at Dovecote, near the village of Walton, was made on the 15th inst., by Mr. G. J. Bell, the County Surveyor. The bridge, which has been erected at a cost of 900*l.*, crosses the ford on the road leading from the village of Walton to Dovecote, Burtholme, Lanercost, and Naworth. It is practically on the site where the Roman wall crossed this river. The bridge, which was designed by Mr. Bell, is built of Lees Hill stone, and has been constructed by Mr. Telfer. The span is 50 ft., and the width within the parapets 17 ft. 6 in.

STREET IMPROVEMENTS AT HALIFAX.—Colonel Hasted, R.E., one of the Inspectors of the Local Government Board, held an inquiry at Halifax, on the 17th inst., into an application of the Town Council for sanction to borrow 24,212*l.* for works of street improvement, &c.

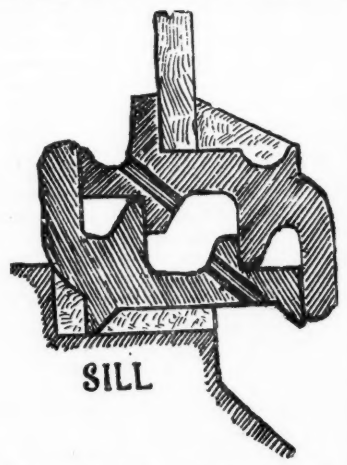
FOREIGN AND COLONIAL.

FRANCE.—The fourth exhibition of the "Rose Croix" Art Society will open on the 20th of March, in the "Galerie des Artistes Modernes," 5, Rue de la Paix.——M. Falguière, the sculptor, and M. Daumet, the architect, have been elected associate members of the Royal Academy of Belgium.——A monument to the celebrated chemist, Boussaingault, is to be erected at the Conservatoire des Arts et Métiers, in the court facing the church of St. Nicolas-des-Champs. It will be executed by M. Dalou, and is to consist of a marble column, at the foot of which will be seated a female figure, symbolising "Science," and a peasant personifying "Agriculture," stretching out palms towards the bust of Boussaingault, which will crown the column.——The jury of architecture at the École des Beaux-Arts has given its award on the Godebœuf competition, the subject of which was "Le point d'appui milieu d'un pont suspendu." Among 157 competitors, the jury awarded the prize to M. Mayeux, pupil of M. Laloux.——M. J. Baconnier has obtained the first prize in the architectural competition instituted by the "Société Académique d'Architecture" at Lyons; the subject of which was "Un projet d'hôtel pour le Gouvernement Militaire de Lyon." M. Meyrieux obtained the first prize in archæological competition, the subject of which was "A Restoration of the Plan of Lyons in the XVIth Century."——The Municipality of Bordeaux have opened a large disinfecting establishment, fitted with all the most recent improvements.——A lift is to be constructed at the railway station at Poitiers to give more easy communication for passengers with the town, which is situated on a height above the railway station.——The Lyons Railway Company are about to build a bridge over the Rhone at Avignon, in order to connect the main line from Paris to Marseilles with that on the right bank of the river.——M. Chenevier, architect, of Verdun, has been elected President of the "Société des Architectes de l'Est," the Honorary Presidents being M. Charles Garnier, of Paris, and M. Cuny, of Nancy.——According to the plans of M. Issartier, the engineer, the projected railway up Mont Blanc will start from the ravine of Miage, above Saint Gervais; it will thence follow a tunnel 7,400 mètres long, and the final ascent will be made through a shaft 2,800 mètres in vertical height. The cost is estimated at 9 million francs.——M. Edouard Bassac, architect, of Vannes, has died at the age of fifty-four. He was a member of the Société Centrale, and architect of the arsenal, the barracks, and the railway terminus at Vannes. He was an "expert" of the Cour d'Appel of Rennes, and a Chevalier of the Legion of Honour.

MISCELLANEOUS.

LIVERPOOL AND THE ATLANTIC PASSENGER TRAFFIC.—The Mersey Docks and Harbour Board, with a view to provide increased accommodation for passengers by trans-Atlantic and other steamers, have commenced the following works:—A railway passenger station at the west side of the south end of the Prince's Dock, with offices and railway lines connected with the main lines of the dock railway, at an estimated cost of 32,000*l.*; laying down on the east side of the Waterloo grain warehouses suitable crossings to form a connexion between the main dock lines and those of the London and North-Western Railway Company at the Waterloo Goods Station, at an estimated cost of 800*l.*; strengthening the shore and stage connexions, and Nos. 4, 5, and 6 bridges of the Prince's Landing-stage, also deepening the water approaches opposite thereto, so as to allow Atlantic passenger and other large steamers to come alongside, at an estimated cost of 7,000*l.* The consent of the Corporation to use locomotives on those portions of the line which are on the public streets has been granted on condition that the speed must not exceed four miles an hour; that the train must not exceed fifty yards in length; that in the daytime each engine must be preceded, at a certain distance, by a man carrying a danger-flag; and that at night both the engine and train must carry lights. The London and North-Western Railway Company has agreed to make all the necessary alterations and improvements for fitting the Waterloo tunnel for passenger traffic, and the entire scheme is expected to be ready by the next Atlantic passenger season. The above plan is only temporary, as even with the present traffic, the Prince's Landing-stage in the summer season would be quite inadequate for both the American, coastwise, and the other foreign traffic. The Dock Board is said to have under consideration a nearly-matured plan for the construction of a much larger landing-stage between the Waterloo and Victoria Docks for the accommodation of the latter trades.

ADAMS' IMPERVIOUS CASEMENT FRAMES.—The accompanying is a section of the sill and foot-rail of these iron frames; a section which seems adapted to keep out even the most driving rain. There are four meeting-surfaces and three water-trapping



channels on the sash and fixed frame. Any moisture formed inside is collected and passed outside, for which purpose a channel is provided, also a groove to give a good hold for the putty. The makers are the Adams' Building Trades Emporium, London,

ROYAL SOCIETY OF ANTIQUARIES OF IRELAND.—At the meeting of the Royal Society of Antiquaries of Ireland, on the 8th inst., at Leinster House, Dublin, Mr. Thomas Drew, R.H.A., F.R.I.B.A., President of the Irish Institute of Architects, was, on a poll, re-elected President of the Society of Antiquaries.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels, held its usual monthly meeting on the 17th inst., at the Society's House, Dean's-yard, Westminster, Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects—viz., building new churches at Lower Sheringham, St. Peter, near Cromer, 100*l.*; Nottingham, St. Bartholomew, 100*l.*; and South Tottenham, St. Peter, Middlesex, 150*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Colebrooke, St. Andrew, near Copplestone, Devon, 25*l.*; and Ruckinge, St. Mary, Magdalene, near Ashford,

Kent, 35*l.* A grant of 50*l.* was also made from the Mission Buildings Fund towards building St. Katharine's Mission Church, Plaistow, Essex. The following grants were also paid for works completed:—Heydon, St. Peter and St. Paul, near Norwich, 25*l.*; Bucknell, St. Peter, near Bicester, Oxon, 20*l.*; and Southwark, St. Saviour, Surrey, 250*l.*

CITY AND GUILDS OF LONDON INSTITUTE.—The annual distribution of prizes and certificates to students at the technical schools in connexion with the City and Guilds of London Institute took place on the 17th inst. at the Fishmongers' Hall. The report showed that at the close of the session out of forty-six matriculated third-year students at the Central College, Kensington, thirty had been awarded the diploma. At the Finsbury Technical College thirty-eight students had obtained certificates. The Institute has continued to co-operate with the London School Board and the Drapers' Company in supporting the manual training classes in elementary schools. The distribution was made by Lord Lorne, who, in his address, commended the practice of the Institute in taking up a variety of subjects of instruction so that the commercial supremacy of the country might be maintained. He pointed out that the City Guilds were the first to promote the establishment of technical schools, and he suggested that the time had arrived for the Government to come to their assistance by forming some sort of central organisation through which children, with special aptitude, might be drafted into the schools.

OLD CIVIC BRISTOL CROSS AT STOURHEAD.—The renovation of this old cross is being undertaken. The work is being carried out under the superintendence of Mr. Charles E. Ponting, F.S.A., diocesan architect for the county of Wilts. The work is being carried out by Messrs. Harry Hems & Sons, sculptors, &c., of Exeter.

BUILDING TRADES ASSOCIATION OF MANCHESTER, SALFORD, AND DISTRICT.—The first annual general meeting of this Association was held on the 16th inst. at the Albion Hotel, Piccadilly, Manchester. The chair was occupied by Mr. R. Holland, who was supported by Mr. R. Neill, Jun., Mr. G. Macfarlane, Mr. C. H. Normanton, and others. The report, which was presented by the secretary (Mr. Fred Scott), explained the evolution of the Association. Notices of proposed alteration of working rules have been received from several of the operatives' associations, and will be dealt with in due course. Resolutions were passed appointing Mr. Holland President for the ensuing year, Mr. G. Macfarlane vice-President, Mr. J. Cantrill treasurer, and a council consisting of three representatives each from five trades and two each from two.

STAINED GLASS WINDOWS AND PAINTED GLASS.—On Saturday last, at the Royal Institution, Mr. Lewis F. Day delivered the first of three lectures on "Stained Glass Windows and Painted Glass." The point of view from which he said he was going to discuss the subject was that of art and craftsmanship, or rather craftsmanship and art, as craftsmanship was always the beginning and the root of all possible art, we being workmen first and then perhaps artists. The industry of glassmaking was said to be five or six thousand years old, but the artist might well be content to take it for granted that from ancient Egypt it had found its way eventually to France, where stained glass windows (as we now knew them) first came into use, and it was certainly from France that we in England first got stained glass. The earliest glass to which definite date could be given was French, and belonged to the year 1108, the oldest window in England being that dated 1174 in the choir of Canterbury Cathedral. Even in the twelfth century stained glass was a rarity, and in speaking of early glass, that of the thirteenth century was generally meant, the time when churches first began to be glazed with it throughout, and, of course, stained glass in the early days was identified entirely with the church. Mr. Day discussed the advance of art up to the period of its decline and collapse in the seventeenth century, and showed at what cost of decorative qualities the later masterpieces were produced. The term stained glass was in some degree applicable alike to the windows of the seventeenth and the sixteenth centuries. In either case there was stained glass and there was painting upon it, the difference being that in the one the painting was only resorted to to help out the stained glass, and in the other the stained glass was introduced only to help out the painting. The earlier glass was "stained in the pot," and the artist was as yet not a painter but a glazier. He really did glass mosaic, and put together the window like the pieces of a puzzle.

SURVEYORSHIP APPOINTMENT.—Mr. G. William Lacey, Assistant Surveyor to the Kettering Urban District Council, has received the appointment of Borough Surveyor of Saffron Walden, Essex.

LEGAL.

CONTEMPT FOR THE PUBLIC HEALTH ACTS.

THE case of the Ilkley Local Board *v.* Oswald Lister came before Mr. Justice Chitty in the Chancery Division, on the 18th inst., it being a motion by the plaintiffs for the committal of the defendant to prison for contempt of court. The action was one for an injunction to restrain the defendant from proceeding with the erection of certain buildings contrary to the provisions of the Public Health Acts, or of the plaintiffs' by-laws. It appeared that interim proceedings were taken by the plaintiffs, and from time to time adjourned, the ultimate result being that on December 5 last a consent order was taken, giving the plaintiffs liberty to set down the action for trial if they thought fit. On December 12, 1894, when an Ilkley local election was pending, the defendant, who was a candidate, wrote and caused to be printed a circular, 1,500 copies of which were distributed amongst the ratepayers of Ilkley. The circular, amongst other things, referred to the "spiteful proceedings" instituted against the defendant by the Board, and also attacked the honesty of its members, and also said that his Lordship "had told them to do their business more honestly." The plaintiffs contended that the defendant had committed a gross contempt of court by making such comments when proceedings were pending; but it was aggravated by the circumstances that the defendant had no foundation whatever for the statements he had made, and that his Lordship had made no such remark as that appearing in the circular. It appeared also that the defendant had some time previously written a letter to the local press containing irregular comments, and had been upbraided by his Lordship.

At the conclusion of the arguments of counsel, his Lordship, in giving judgment, said that the circular was clearly a gross contempt of court. It contained misrepresentations of what took place in Court. The statements made by the defendant were not merely incorrect, but they reflected most seriously on the plaintiffs. There was no foundation whatever for them. The defendant had already been warned by the court, but the warning did not appear to have had any effect. He had offered an apology, and it was also said on his behalf that he was an uneducated man. Taking these circumstances into consideration the order would be that the defendant should be committed for ten days, and to pay the costs.

Mr. Farwell, Q.C., and Mr. Pattison appeared as counsel for the plaintiffs, and Mr. Eustace Smith for the defendant.

CASE UNDER THE METROPOLIS MANAGEMENT ACT, 1855.

THE case of Pilbrow *v.* the Vestry of St. Leonard's, Shoreditch, came before the Court of Appeal, consisting of the Master of the Rolls and Lords Justices Lopes and Rigby on Monday last.

The facts of the case are shortly as follows: Mr. Pilbrow (the appellant) in 1882 erected two blocks of buildings, consisting of forty-six sets of apartments, which were separated by a causeway 20 ft. wide. The two blocks were drained by twelve branch drains which were connected with a main drain which ran beneath the causeway into the sewer. In 1891, the Inspector of Nuisances gave Mr. Pilbrow notice to mend and re-construct the main drain, and the notice having been disregarded, the Vestry did the work at an expenditure of 209*l.* 7s. 6d., which they now sought to recover from Mr. Pilbrow, who, however, disputed the claim on the ground that the main drain in question was a sewer within the meaning of the Act, and that therefore he was not the owner, and maintaining that the vestry were liable for the expense of altering it. The magistrate who tried the case decided against Mr. Pilbrow, holding that inasmuch as the main drain in question drained blocks of houses by a combined operation it was under the circumstances, and notwithstanding the absence of any order of the vestry, for the purpose a "drain" and not a "sewer" within the meaning of the Interpretation Clause, Section 250, of the Metropolis Management Act, 1855, and ordered Mr. Pilbrow to pay the amount charged. The magistrate, however, at the wish of the appellant stated a case for the opinion of the High Court, and the case was argued before Justices Mathews and Charles, who affirmed the magistrate's decision.

At the conclusion of the arguments of counsel their lordships (Lord Justice Rigby dissenting) dismissed the appeal with costs.

Mr. Haldane, Q.C., and Mr. Woodfin, appeared as counsel for the appellant; and Mr. Finlay, Q.C., and Mr. Lewis Thomas for the respondents.

THE ERECTION OF BATHS AND WASH-HOUSES:

CONTRACTORS' DISPUTE.

IN the Court of Appeal on Monday, Lord Halsbury and Lords Justices Lindley and Smith had before them the case of the Commissioners for Public Baths and Wash-houses for the parish of St. John, Hackney, *v.* Roome. This was the plaintiffs' appeal from the decision of Mr. Justice Stirling dismissing their motion.

Mr. Moulton, Q.C., and Mr. Lowe appeared for the appellants; and Mr. Graham Hastings, Q.C., and Mr. Bray, represented the respondents.

Mr. Moulton said this was an appeal from the decision of Mr. Justice Stirling, who declined to make an interim order directing the defendant to give up certain premises belonging to the plaintiffs, which he held for the purpose of carrying out certain work. The plaintiffs were the Commissioners of Public Baths and Wash-houses in the parish of St. John's, and on February 16 last they entered into a contract with the defendant to build certain baths and wash-houses. The work was to cost about 36,000*l.*, and was to be completed within a year. The work was commenced on February 26 last, and in July the defendant made complaints that the clerk of the works was not very easy to get on with, and an inquiry was held with regard to it. On October 22 the defendant wrote to say that the clerk of the works was very troublesome, and that he would suspend the works. Thereupon the plaintiffs—there being a clause in the contract which provided that if the works were suspended or not gone on with with reasonable speed they could give notice to proceed, or, in default, take possession—gave notice that if the works were not gone on with they would take such steps as the contract empowered them to take. To this notice the defendant's solicitors replied that they had advised him to comply with the notice and proceed with the work, and then decide what damage he was entitled to with a view to the whole thing being submitted to arbitration, and that they might take it that the defendant would proceed at once, though he would reserve all rights against the Commissioners for the heavy damages he had suffered. Since that time, continued counsel, there had never been more than four men employed, although the contract stated that 80 to 120 men were to be employed throughout the whole year. The plaintiffs waited for a time, but finding nothing going on gave a second notice. Nothing further was done by the defendant, and after seven days had expired the plaintiffs sent their architect and one of their representatives down to take possession. The defendant, however, refused to give up the premises, and gave instructions to turn the plaintiffs' representatives out if they did not go, and from that time till now he had held possession of the works; he would not complete them and would not let the plaintiffs do so. After the first suspension, which had, in fact, lasted up to the present time, he called his creditors together and put forward a statement of affairs which showed that he was not a solvent man. He had not done the work, he would not do the work, and the building was standing in an unfinished condition, thereby suffering great damage.

Lord Justice Lindley: What happened when his creditors were brought together?

Mr. Moulton: No arrangement was made, but he has not been made bankrupt. His statement showed there was a deficiency of 2,000*l.* or 3,000*l.* He thought it reasonably clear that the man was not in a position to undertake work of this kind. The Commissioners made an arrangement that if he went on he should not have any more trouble with the clerk of the works. They claimed that under the contract they were entitled to take possession, but this was met by the defendant pointing out that there was an arbitration clause in the agreement, but as far as possession was concerned there was no need of arbitration.

Lord Halsbury: If it is your clerk of the works, who is your agent, that prevents him going on with the works, is that not a question for the arbitrator?

Mr. Moulton: The clerk of the works has to submit everything to the architect. What I say is that the defendant is there for the purpose of doing this work. It cannot be right that he should be there and do no work. He cannot say that past difficulties entitle him to retain possession without going on.

Lord Justice Lindley: What was your notice of motion, and what was your claim?

Mr. Moulton: It is for an injunction to restrain the defendant from retaining possession and from preventing the plaintiffs from entering upon and taking possession of the works referred to. Mr. Justice Stirling took the view that the relief we asked for in the action could not be granted by an interim injunction.

Mr. Graham Hastings said that if his friend's clients would go to arbitration at once they would give up possession.

Mr. Moulton: We will go if you give us possession.

Lord Halsbury: Then there is an end of the matter.

Mr. Moulton said before the contract was given to the defendant certain securities had to be given. By consenting to this order he did not want to imperil his position in regard to those guarantors. With that exception he was ready to go to arbitration.

Lord Halsbury: Is there anybody here representing the guarantors?

Mr. Moulton: I should think my friend is not very far from that position. It is a matter of great importance to them.

Mr. Graham Hastings pointed out that the guarantors were not before the Court.

Lord Halsbury: How do you say this affects the guarantors?

Mr. Moulton: Why, if we agree to vary the contract by consent the guarantors might say they only agreed to the performance of the original contract.

Lord Halsbury: Don't you think it had better be

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Schools	Darenth School Board	.....	Feb. 6
*Infectious Diseases Hospital	Penzance Town Coun.	31*l.* 10s. 21*l.* and 15*l.* 15s.	Mar. 19
*Schools	Portmadoc County Schools	.....	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Sewering, &c. Dennison-street	York Corporation	A. Creer	Jan. 29
Shops, Houses, &c. Holderness-road, Hull	Trustees of Lairgate Church Endowment	.....	do.
Sewerage Works	Stanley (Durham) U.D.C.	*Official*	do.
Sewage Outfall Works, Cosham, Hants	Fareham R.D.C.	A. Ford	do.
Pipe Sewer (883 yds.)	Runcorn U.D.C.	*Official*	do.
Stoneware Pipes	do.	do.	do.
*Road Works	Lewisham Bd. of W.	do.	do.
*York Paving	Tottenham U.D.C.	P. E. Murphy	do.
Building Work in the Park	Bootle Corporation	*Official*	do.
Building Work at Schools	Leeds School Board	do.	do.
Waterworks	Bandon(Ireland)Union	A. Haynes	Jan. 30
House and Shop, The Knock, Banffshire	Mr. Morrison	C. C. Doig	do.
Business Premises, Oakfield, Kelty, N.B.	.....	Jno. Houston	do.
Sewering, Paving, Kerbing, &c. Meyer-street and others	Stockport Corporation	J. Atkinson	do.
Granite Setts and Macadam	Whitefield (Lancs.) D.C.	W. Skinner	do.
Cast-iron Main Pipes	Todmorden T. C.	H. Shaw	do.
Public Bath, Sneinton	Nottingham Corp.	A Brown	Jan. 31
Business Premises, Market-place, Bideford	Tattersill & Snow	R. T. Hookway	do.
Villa, Park-street, Bridgend	J. H. Williams	Lambert & Rees	do.
Factory, Kegworth, Leicester	Kegworth Factory Co. Lim.	G. H. Barrowcliff	do.
Additions, &c. to Meltham Hall, near Huddersfield	.....	John Kirk & Sons	do.
Paving, Inskip-terrace, &c.	Gateshead Corp.	*Official*	do.
Cast-iron Water Pipes (1,660 yds.)	Pudsey (Yorks) U.D.C.	do.	do.
Additions to National Schools, Little Baddow, Essex	School Managers	Chas. Pertwee	Feb. 1
Baptist Chapel, Glanadda, Bangor, North Wales	.....	R. Glynne Davies	Feb. 2
Four Cottages, St. Radigund's-street, Canterbury	.....	W. J. Jennings	do.
Two Pairs Semi-detached Houses, Gillingate	Kendal Co-op. Society, Lim.	Jno. Stalker	Feb. 4
Business Premises, The Square, Buckie, near Elgin, N.B.	.....	G. Sutherland	do.
Cast-iron Pipes (2,800 tons), Stourbridge	Upper Stour Valley Main Sewerage Bd.	Marten & Fiddian	do.
Road Works, Greenbank-road, near Liverpool	Toxteth Park U.D.C.	J. Price	do.
Forming and Paving, Birchall-street	Warrington Corp.	Thos. Longdin	do.
Market Extension	Plymouth Corp.	King & Lister	do.
*Alterations &c. to Schools	Warwick National Sch. Managers	F. H. Moore	do.
Additions to Schools, Beaufort Hill, Brecon	Llangattock Sch. Bd.	*Official*	do.
Additions to Houses, Electricity Works, Crowlands	Southport Corp.	do.	do.
Residence at School, Lodge-lane	Aston-cum-Aughton (Yorks) School Board	F. L. Sorby	Feb. 5

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Construction of Pipe Sewers	Camberwell Vestry	O. S. Brown	Feb. 6
Additions to Schools, Wrecclesham, Farnham	.....	W. J. Wells	do.
*Works and Materials	Westminster Vestry	G. R. W. Wheeler	Feb. 5 & 6
Sewer, Saddlebow-road	King's Lynn Corp.	E. J. Silcock	Feb. 6
Footbridge, over River Test, near Longparish, Hants	Andover R.D.C.	G. H. Stagg	do.
Fourteen Cottages	Penrhiwceiber (Wales) Building Club	.....	do.
Roadmaking, Paving, &c. Shoreham-road	Hove (Sussex) U.D.C.	*Official*	do.
*Road Materials	St. Saviour's Bd. of W.	do.	do.
*Removal of House Refuse, &c.	St. Pancras Vestry	do.	do.
*Station Buildings and Widening Bridge, Knott Mill	Manchester South Junction & Altrincham Ry. Co.	do.	Feb. 7
*New Wards, N.W. Hospital	Met. Asylums Board	do.	do.
Schools, Vron, Wrexham	Brymbo School Board	W. Moss	do.
*Warehouse at Prince of Wales Dock	Swansea Harb. Trust.	O. E Schenk	do.
*Broken Guernsey Granite	Bethnal Green Vestry	*Official*	do.
*Boilers and Cooking Apparatus	Tonbridge Union	Clements, Jeakes, & Co.	Feb. 8
Road Works	Cockermouth R.D.C.	M. Wilson	do.
*Construction of Waterworks	Bilston U.D.C.	B. Latham	Feb. 9
*Cast-iron Water Pipes	Lathom and Burscough U.D.C.	Wood & Brodie	Feb. 11
House at Asylum, Carlisle	Cumberland C. C.	G. D. Oliver	do.
*Public Conveniences, Bostall Heath	LondonCountyCouncil	*Official*	Feb. 12
Cemetery Chapels and Lodge, Easbing-lane	Godalming Burial Bd.	do.	Feb. 14
*Sewerage and Water Works	Stratford-on-Avon R.D.C.	J. E. Willcox	do.
*Brick Sewers	Rawtenstall & Bacup Joint Sewerage Com.	H. A. Cutler	Feb. 16
Sewage Outfall Works, Buildings, &c.	Brierfield(Lancs)U.D.C.	J. T. Landless	Feb. 18
*Police Offices, Cells, Court, &c	Rotherham Corp.	R. J. Lovell	Feb. 20
*Sewerage Works	Uckfield U.D.C.	W. W. Gale	Feb. 23
*School and Residence	Ashford School Board	H. J. Jeffrey	Mar. 4
Public House, Bramall, Stockport	D. Clifton & Co.	P. Peirce & Son	No date
Schools, Room, &c. near Salisbury	Downton School Bd.	J. Harding & Son	do.
Schools, Boscombe, Bournemouth	British School Com.	Lawson & Donkin	do.
*Rifle Butts, Gravesend	War Department	*Official*	do.
Additions to Schools, Bolventor, near Launceston	Altarnun School Bd.	Wise & Wise	do.
Schools, Smithy-hill	Harrogate School Bd.	T. Edw. Marshall	do.
Nine Houses, Allerton, Yorks	John Gill	.....	do.
Business Premises, Bridge-street, Belfast	Tate Bros.	.....	do.
Cottages, Simpson-street, Rochdale-road, Manchester	J. C. M. Turner	.....	do.
Offices	Wombwell (Yorks.) U.D.C.	J. Robinson	do.
Rebuilding George Hotel, Boothroyd-lane, Dewsbury	.....	W. H. D. Horsfall	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Engineer's Assistant	Tottenham U.D.C.	150*l.*	Jan. 28
*Plumbers' Teacher	Trades Training Sch.	.....	Jan. 28
*Inspector of Nuisances and Surveyor	Chertsey U.D.C.	160*l.*	Jan. 29
*Surveyor and Inspector of Nuisances	East Barnet Valley U.D.C.	300*l.*	Feb. 8
Engineer. Birmingham	South Staffs. Waterworks Co.	600*l.*	Feb. 19

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv., vi., viii., ix., *and* xviii. *Public Appointments, p.* xvi.

allowed to stand over for a few days, when you can see what can be done, and mention it to us again?

This was agreed to, and the case accordingly stood over in order that the consent of the guarantors might be obtained to the dispute going at once to arbitration.

BUILDER AND ARCHITECT:

CLAIM FOR QUANTITIES IN EXCESS OF TENDER.

IN the Queen's Bench Division on Tuesday last, Mr. Justice Grantham had before him the case of Pink *v.* Warner. This was an action arising out of certain errors in the quantities used in building a house, and a somewhat important point was raised.

Mr. Gully, Q.C., and Mr. Muir Mackenzie appeared for the plaintiffs, the executors of Robert Pink, a builder; and Mr. Bousfield, Q.C., and Mr. Atkinson represented the defendants, the executors of a Miss Lindsey, for whom Pink built the house in question.

Mr. Gully said that in the course of 1891 Pink entered into a contract to build a house for Miss Lindsey on a site covered by trees in the village of Compton, near Godalming. Mr. Pink's tender of 3,798*l.* was accepted, but there were very serious errors in the quantities, which were furnished in a somewhat peculiar manner. These quantities were not, as was usual, ordered from the architect or a building surveyor, but were drawn up, probably (said Mr. Gully) from motives of economy, on the part of the architect, Mr. Francis Bacon, who stipulated that the buildings were to be executed according to the drawings and specifications, and upon these Pink based his tender. The builder, however, discovered that the quantitities came out very much larger than he thought.

After deducting from the plaintiffs' claim 5,514*l.* 16s. 9d., certain sums paid by the defendants into court, the claim in dispute amounted to 1,614*l.*

For the defence it was submitted that it was the duty of a builder to take out the quantities which he required for the purposes of his tender. It was not the employer who wanted the quantities. Assuming that the architect, as Miss Lindsey's agent did, gave the builder an incorrect idea of the quantities, that was the builder's own look out. If the builder entered into a contract to build a specific building for a specific sum he must perform the contract.

Without hearing the evidence, his Lordship said he had no doubt whatever that the defendants were liable, and he decided in favour of the plaintiffs.

Counsel then suggested that the tender should be remodelled, and the defendants should pay the difference between the original tender and the new one, an independent surveyor to ascertain the quantities.

This was agreed to for the purpose of ascertaining the amount to be paid to the plaintiffs, but Mr. Bousfield, on behalf of the defendants, gave notice to appeal on the question of principle.

His Lordship said he thought it was throwing good money after bad. It could only be an appeal on a mere technicality.

Mr. Bousfield said his lay clients were not present, and he was bound to act upon instructions.

His Lordship said that being so the case had better stand over to give the defendants an opportunity of saying what they would do.

CAPITAL AND LABOUR.

DISPUTE IN THE LONDON BUILDING TRADE.—The strike at Messrs. Trollope's, builders, after lasting several weeks, has just collapsed. Ever since the men ceased work pickets have been placed at the various buildings on which Messrs. Trollope have been engaged, but these have not been successful in preventing the new men from carrying on building operations. The pickets have now been removed, and thus the strike has broken down.

STATE OF EMPLOYMENT IN DECEMBER.—According to the *Labour Gazette*, sixty-seven trade unions, with an aggregate membership of 367,796, have made returns to the Labour Department of the Board of Trade, showing the total number of unemployed members at the close of the year to be 28,484, or 7·7 per cent., compared with 7·0 per cent. in the 62 unions from which returns were received for November, and 7·9 per cent. in the 32 unions making returns for December, 1893. A slight seasonal falling-off is again observable in the building trades, and the percentage of unemployed in unions making returns has increased from 4·2 to 5·7, the percentage for December, 1893, having been 5·8. The building trades in London, owing mainly to seasonal causes, show a decline when compared with last month, 155 branches of 6 unions, with an aggregate membership of 11,427, returning 642 (or 5·6 per cent.) as unemployed, compared with 4 per cent. in November, and 6·6 per cent. in December, 1893. The bricklayers, plasterers, masons, carpenters, and mill-sawyers, with an aggregate membership in the London district of 21,328, describe trade as "dull"; the plumbers, painters, and stone-carvers, with an aggregate membership of 3,345, as "bad."

MEETINGS.

FRIDAY, JANUARY 25.

Institution of Civil Engineers (*Students' Meeting*).—Mr. F. E. Wentworth-Sheilds "On the Strength of Large Graving-Docks." 8 p.m.

Royal Institution.—Sir Colin Scott-Moncrieff on "The Nile." 9 p.m.

SATURDAY, JANUARY 26.

Royal Institution.—Mr. Lewis F. Day on "Stained Glass Windows and Painted Glass—from the Point of View of Art and Craftsmanship." II. 3 p.m.

Institution of Junior Engineers.—Tenth Anniversary Dinner, Westminster Palace Hotel. Mr. Alexander Siemens, President, in the chair. 6.30 p.m.

Sanitary Inspectors' Association (*St. James's Hall*).—Mr. S. G. Fairchild on "Details of Plumbers' Work." II. 7.30 p.m.

St. Paul's Ecclesiological Society.—Annual meeting, to be held in the Trophy-room in the Cathedral, at 2.30 p.m.

Queen's College, Cork.—Mr. Arthur Hill on the "History of Architecture." VIII. 3 p.m.

SUNDAY, JANUARY 27.

South Place Institute.—Mr. J. W. Harland on "Lithography; its Past, Present, and Probable Future." 4 p.m.

MONDAY, JANUARY 28.

Royal Institute of British Architects.—Mr. J. A. Strahan, M.A., Barrister-at-Law, on "The Legal Position of Architects in relation to Certificates and Awards." 8 p.m.

Royal Academy.—Professor Aitchison, A.R.A., on "The Advancement of Architecture." I. 8 p.m.

Society of Arts (*Cantor Lectures*).—Professor Silvanus P. Thompson, D.Sc., F.R.S., on "The Arc Light." III. 8 p.m.

TUESDAY, JANUARY 29.

Institution of Civil Engineers.—Mr. William H. Fowler on "Boiler Explosions." 8 p.m.

WEDNESDAY, JANUARY 30.

Northern Architectural Association.—7.30 p.m.

THURSDAY, JANUARY 31.

Royal Academy.—Professor Aitchison, A.R.A., on "The Advancement of Architecture." II. 8 p.m.
Society of Antiquaries.—8.30 p.m.
Civil and Mechanical Engineers' Society.—7 p.m.

FRIDAY, FEBRUARY 1.

Architectural Association.—Mr. W. S. Weatherley on "Architectural Perspective." 7.30 p.m.
Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Mr. J. Castell-Evans on "Physics and Chemistry." I.: "Mechanical Physics." 8 p.m.

SATURDAY, FEBRUARY 2.

Architectural Association.—Spring visit to the Church House, Dean's Yard, Westminster. 3 p.m.
Royal Institution.—Mr. Lewis F. Day on "Stained Glass Windows and Painted Glass." III. 3 p.m.
Sanitary Inspectors' Association.—Twelfth Annual Dinner, Holborn Restaurant. 6 p.m.
Queen's College, Cork.—Mr. Arthur Hill on the "History of Architecture." IX. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

767.—WATER WASTE PREVENTER: *J. Bell.*—This invention consists of an arrangement of plug and outlet valve controlled by pneumatic action. Mechanical means for actuating the apparatus is described in the specification.

1,073.—OVENS: *E. W. T. Richmond.*—This patent relates to improvements in gas or cooking ovens designed principally to enable the oven to be cleaned of grease and fat. The shelves or brackets are detachably fastened to the sides and swing outward so as to be easily cleaned.

3,287.—STOVES AND FIREPLACES: *J. W. Spencer.*—According to this patent a grate or firebasket with sloping sides has passages to conduct an extra amount of air to the back of the mass of fuel. An opening to the flue is controlled by a register door, so that on first lighting the fire the current is quickly drawn upward, and when the draught in the flue is once established it may be partially or wholly closed.

3,458.—FLUSHING APPARATUS: *W. Briggs.*—To make a noiseless flush, an apparatus consisting of a cylinder with a perforated plate and diaphragm carried on a rod passing out through the top of the cylinder and through a tube fixed in the said top made air-tight to form an air-valve by means of a rubber washer is designed; when the rod is lifted the water charges the syphon and excludes the air from the syphon till the water is finished, but a full discharge is allowed for.

3,708.—WINDOW-SASHES: *J. Mair.*—The main object of this invention is to make the sashes wind and water tight at the side edges. The sliding-bars and swivelling-frames have projecting ribs or beads fitting or tapering into each other, forming a thoroughly water-proof joint, and locking fittings are added for security.

15,755.—STONE COMPOSITION: *J. Elliott.*—The composition which forms the subject of this patent is made of natural stones—Bath, Portland, Yorkshire, and Kentish Rag—with chalk, flints, or sea-beach ground to powder, then placed on a plate over a furnace to be thoroughly dried. Portland cement is afterwards added, and colouring so as to match any stone that is to be repaired.

21,685.—ANTI-SYPHON PIPES: *W. Tate.*—Instead of fixing the pipes by brass terminals, an iron-socketted pipe is arranged so that if the trap is broken it can be removed without interfering with the pipe. The branch is specially made for this purpose.

NEW APPLICATIONS FOR LETTERS PATENT.

JANUARY 7.—393, W. Eckstein and J. Willmore, Ventilators.—414, F. Crane, Paints or Driers.—416, The Adamant Company, Limited, and J. Wilkinson, Fireproof Flooring and Ceiling.

JANUARY 8.—471, G. Grossheim, Stencil Plates for Painters and Decorators.—474, G. Parkinson, Guarding Circular or other Saws.—529, C. Rogers, Closet-pans and Water-closet Ventilation.

JANUARY 10.—596, W. Whitehead, Chimney-cowls for the Prevention of Down-draughts in Chimney.—641, G. Thomson, Artificial Stone, Roofing and other Tiles and Enamels; and in Apparatus Therefor.—642, G. Thomson, Treating Stone.

JANUARY 11.—704, E. and J. Podmore, Glazing Bars for Glazing Greenhouses, Railway-stations, and other Glazed Structures.—706, G. Locke, Up-draught Chimney-pot.—722, R. Matthews and others, Drainage.—783, A. McBean, Windows.—784, E. Wilkinson, Draught-excluders for Doors, &c.—832, M. Burow, Automatic Spring Bolts for Folding Doors.

PROVISIONAL SPECIFICATIONS ACCEPTED.

22,982, E. Fawcett, Choked-drain Indicator.—23,784, W. Middleton, Door Catches.—23,794, A. Bond, Syphon Automatic Flushing Apparatus.—23,879, F. Golby, Device for preventing Persons falling from Ladders.—23,916, W. Ranson, Fastening for Door-Knobs.—24,030, S. Srawley, Sash Fasteners.—24,436, J. Eastham, Sash Fasteners.—24,565, F. Burrell, Sash Fasteners.—24,745, F. Curley, Detachable Ornamental Fibrous Plaster Covers for Electric-light Ceiling Fittings.—24,940, J. Shaw, Repairing or Re-facing the Seatings of Water-taps.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.

3,417, E. Wilson, Wood-working Machines for Trimming, Mitreing, &c.—4,708, J. Chadwick, Chimneys, &c.—13,318, J. Burke, Wood-working Machines.—17,276, J. Knittel, Hinges.—20,677, R. Moore, Water-closet Trap.—22,963, E. Read, Protecting the Joints of Windows, &c.—23,808, R. Ames, Machines for Manufacturing Drain, Sewer, and other Pipes.—24,011, E. Cowcher, Screws.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JANUARY 17.—By *Segrave, Browett, & Taylor:* 19, Hayne-rd., Beckenham, f., 1,630*l.*—By *Newbon & Co.:* 1, 3, 5, and 7, Graham-rd., Dalston, u.t. 57 yrs., g.r. 12*l.*, r. 154*l.*, 1,680*l.*; 112, 114, and 116, Dalston-lane, u.t. 57 yrs., g.r. 21*l.* 5*s.*, r. 104*l.*, 1,025*l.*; 7 and 11, Ritson-rd., u.t. 57 yrs., g.r. 7*l.* 3*s.* 4*d.*, r. 66*l.*, 685*l.*; 26, Mayes-rd., Wood Green, u.t. 84 yrs., g.r. 7*l.* 7*s.*, r. 35*l.*, 250*l.*; 45, Hemingford-rd., Barnsbury, u.t. 48 yrs., g.r. 6*l.*, r. 40*l.*, 360*l.*; 1, Shepperton-rd., Hoxton, u.t. 37 yrs., g.r. 8*l.*, r. 70*l.*, 635*l.*

JANUARY 18.—By *Baker & Sons:* F.g.r. of 89*l.* 5*s.*; Bartholomew-close, City, reversion in 16 yrs., 3,550*l.*; 6 and 9, Albion-buildings, Bartholomew-close, f.r. 130*l.*, 2,850*l.*; 455, Bethnal Green-rd, Bethnal Green, f., 1,350*l.*; f.g.r. of 45*l.*, Upland-rd, East Dulwich, reversion in 90 yrs., 1,405*l.*; f.g.r. of 6*l.*, Albert-rd., Peckham, reversion in 69 yrs., 185*l.*; f.g.r. of 25*l.*, Albert-road, reversion in 71 yrs., 710*l.*; f.g.r. of 8*l.* 8*s.*, St. George's-st, reversion in 54 yrs., 230*l.*; f.g.r. of 7*l.*, Frampton-rd, reversion in 59 yrs., 195*l.*; f.g.r. of 12*l.*, Frampton-rd., reversion in 59 yrs, 330*l.*; f.g.r. of 25*l.*, Gordon-ter., reversion in 96yrs., 715*l.*; f.g.r. of 14*l.*, Hesseter., reversion in 73 yrs., 385*l.*; f.g.r. of 14*l.*, Rosemary-rd., Camberwell, reversion in 67 yrs., 410*l.*; f.g.r. of 24*l.*, Denmark-ter., reversion in 67 yrs., 665*l.*; f.g.r., of 18*l.*, St. George's-rd., reversion in 83 yrs., 495*l.*; f.g.r. of 73*l.*, Dorton-st., reversion in 83 yrs., 2,015*l.*; f.g.r. of 9*l.* 10*s.*, Sedgmoor-pl., reversion in 23 yrs., 330*l.*; f.g.r. of 24*l.*, Copleston-rd., Peckham, reversion in 81 yrs., 700*l.*; f.g.r. of 24*l.*, Bellenden-rd., reversion in 81 yrs., 685*l.*; i.g.r. of 6*l.*, Vicarage-rd., Camberwell, u.t. 55 yrs., g.r. 4*l.* 4*s.*, 31*l.*; 43, Vicarage-rd., u.t., 55 yrs., g.r. nil., r. 51*l.*, 515*l.*; f.g.r. of 36*l.*, Bennerley-rd., Battersea, reversion in 74 yrs., 1,060*l.*; f.g.r. of 33*l.*, Crichton-rd., Wandsworth-rd., reversion in 70 yrs., 940*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	8/:/o 0/0/0
Teak, E I.	load	10/0/0 15/0/0
Sequoia, U.S. ft. cu		1/0 2/2
Ash, Canada	load	3/0/0 4/5/0
Birch, do.		3/c/0 4/5/0
Elm, do.		3/15/0 5/0/0
Fir, Dantsic, &c.		1/10/0 3/0/0
Oak, do.		2/15/0 4/15/0
Canada		5/5/0 6/15/0
Pine, Canada red		2/15/0 3/5/0
Do. Yellow		3/10/0 5/15/0
Lath, Dantsic, fath		4/10/0 5/10/0
St. Petersburg		5/0/0 6/10/0
Wainscot, Riga, &c., log		2/15/0 5/0/0
Odessa, crown		2/15/0 5/0/0
Deals, Finland 2nd & 1st std	100	7/0/0 9/0/0
Do. 4th & 3rd		7/0/0 8/0/0
Do. Riga		7/0/0 8/10/0
St. Petersburg, 1st yellow		9/10/0 12/0/0
Do. 2nd yellow		7/10/0 9/0/0
Do. white		8/0/0 10/10/0
Swedish		7/0/0 15/10/0
White Sea		6/10/0 14/0/0
Canada, Pine 1st		21/0/0 24/10/0
Do. do. 2nd		16/10/0 17/10/0
Do. do. 3rd, &c.		7/10/0 10/10/0
Do. Spruce, 1st		8/10/0 10/0/0
Do. do. 3rd and 2nd		6/10/0 7/10/0
New Brunswick		6/0/0 7/0/0
Battens, all kinds		5/0/0 21/c/0
Flooring boards, sq., 1 in. prep. 1st		0/9/6 0/14/0
Do. 2nd		0/7/0 0/11/6
Other qualities—		0/5/0 0/7/0
Cedar, Cuba	ft.	/3 /4
Honduras, &c.		/3 /4½
Mahogany, Cuba		/3 /6
St. Domingo, cargo av.		/3 1/6
Mexican do. do.		/3 /4
Tobasco do. do.		/3 /6
Honduras do.		/3½ /5½
Box, Turkey	ton	4/0/0 13/0/0
Rose, Rio		7/0/0 18/0/0
Bahia		6/0/0 17/0/0
Satin, St. Domingo		0/0/5 0/1/0

TIMBER (*continued*).		
Satin, Porto Rico	c/0/6	0/1/6
Walnut, Italian	c/0/3½	c/./7

METALS.		
Iron—Pig, in Scotland	ton	2/1/5½ 0/c/0
Bar, Welsh, in London		5/12/6 5/15/0
Do. do. at works in Wales		5/2/6 5/5/0
Do. Staffordshire, in London		6/0/0 6/10/0
COPPER—British cake and ingot		43/5/0 43/15/0
Best selected		43/15/0 44/5/0
Sheets, strong		51/10/0 0/0/0
Chili bars		4/:/13/9 40/18/9
YELLOW METAL	lb	0/c/4½ 0/0/4½
LEAD—Pig, Spanish	ton	9/12/6 9/13/9
English com. brands		9/13/9 9/15/0
Sheet, English, 6 lbs. per sq. ft. and upwards		1c/15/0 11/c/0
Pipe		11/15/0 c/0/0
ZINC—English sheet	ton	18/10/0 19/0/0
Vieille Montagne		19/10/0 0/0/0
TIN—Straits		60/2/6 60/12/6
Australian		60/12/6 61/2/6
English Ingots		63/./0 63/1c/0
Banca		61/10/0 62/0/0
Billiton		60/1c/0 61/0/0

OILS.		
Linseed	ton	19/17/6 20/2/6
Cocoanut, Cochin		25/0/0 c/c/0
Do. Ceylon		23/10/0 0/0/0
Palm, Lagos		23/10/0 0/0/0
Rapeseed, English pale		22/0/0 0/0/0
Do. brown		20/1c/0 0/0/0
Cottonseed ref.		17/10/0 18/10/0
Oleine		21/0/0 22/10/0
Lubricating, U.S.		4/0/0 5/0/0
Do. refined		5/0/0 12/0/0
TAR—Stockholm	barrel	1/1/0 0/0/0
Archangel		0/13/0 c/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*]

BECKENHAM (Kent).—For the supply of 1,200 yds. Cherbourg granite, for the Local Board. Mr. J. A. Angell, C.E., Local Board Offices, Beckenham:—

For 2-in. Quartzite.

Kent-road Co., Gravesend* ..... 15s. 6d.

For 2-in. Penlee Elvan.

J. Runnalls, Penzance* ..... 14s. 10d.

For 2-in. Quenast.

C. Manuelle ..... 14s. 1d.
* Accepted.

BRADFORD (Yorks.).—For the erection of a chimney, Junction Mills, Laisterdyke, for Mr. W. W. Wood. Mr. Thos. Barker, engineer, 5, Bond-street, Bradford:—

Miles & Warner	£638 10	Humphreys & Moulson	£455 0
Broscup & Sons	522 0	C. Booth & Son	438 0
William Holdsworth	515 0	Jabez Williams	422 0
T. Illingworth	497 0	Joseph Coates, Laisterdyke*	400 0
Toothill & Balmforth	483 0	R. F. Dawson	375 0
Hutchinson	455 0		
J. Moulson & Sons	455 0		

* Accepted.

BRISTOL.—For rebuilding St. Michael's Schools. Mr. Wm. V. Gough, architect, 24, Bridge-street, Bristol. Quantities by architect:—

G. Humphreys	£2,488 0	Hatherley & Carr	£2,272 0
J. Browning	2,458 0	A. J. Beaven	2,253 0
J. Bastow	2,414 0	Wilkins & Gosling	2,192 0
Eastabrook	2,411 0	E. Love	2,178 0
H. J. Ressiter	2,395 3	R. Wilkins & Sons	2,135 0
Thos. H. Brown	2,339 7	E. Walters	2,110 0
M. Durnford	2,317 0	W. Veals	2,103 0
J. E. Davis	2,304 0	G. Downs	2,089 0
Bale & Westlake	2,292 18	Geo. Hy. Wilkins, 48, Thomas-street*	2,030 0
H. A. Forse	2,291 0		
W. Cowlin & Son	2,286 0		

* Accepted.

BRISTOL.—For the erection of school buildings at the Causeway, Fishponds, for the Stapleton School Board. Mr. W. V. Gough, 24, Bridge-street, Bristol. Quantities by architect:—

Hatherley & Carr	£3,765 0 0	E. Walters	£3,329 0 0
Eastabrook & Son	3,621 0 0	J. Browning	3,293 15 0
S. Williams	3,569 5 8	E. Field & Son	3,247 19 11
H. A. Forse	3,566 11 6	E. Love	3,221 10 0
A. J. Beaven	3,510 0 0	R. Wilkins & Co.	3,180 6 0
Edwin Clark	3,456 0 0	C. A. Hayes	3,148 0 0
Bale & Westlake	3,414 13 5	L. Wilkins & Gosling	3,140 19 11
Cowlin & Son	3,397 0 0	H. J. Rossiter	3,135 10 0
Humphreys & Son	3,389 18 6	Geo. Hy. Wilkins, 48, Thomas-street*	3,121 10 0
J. E. Davis	3,368 0 0		

* Accepted.

CARDIFF.—For road-making, &c., Pontcanna Estate. Mr. C. Telford Evans, architect, 14, Queen-street, Cardiff. Quantities by architect:—

Gardner & Happerfield	£1,343 0 0	James Rich	£1,012 19 2
Thos. Evans	1,299 0 0	B. Evans	975 0 0
Frank Ashley	1,192 16 2	Barnes, Chaplin, & Co.	939 7 1
John Mackay	1,142 15 8	E. H. Page, Cardiff*	932 11 9
Thos. Rees	1,100 5 0		
T. Street	1,035 12 0		

* Accepted.

DORCHESTER.—For the erection of a church, asylum estate, Charminster. Mr. G. T. Hine, architect. 35, Parliament-street, Westminster, S.W.:—

C. E. Slade	£3,215	J. Guy & Son	£2,424
Pollard	3,000	J. W. Lucas	2,420
Cornish & Gaymer	2 930	Jenkins & Sons	2,365
S. F. Halliday	2,671	H. J. Kite, Salisbury*	2,350
W. Gibson	2,543	J. & H. Bagg	2,190
Abel Harvey	2,520		

* Accepted

HUNTSPILL (Somerset).—For the erection of Baptist Congregational Chapel. Mr. H. D. Pitts, architect, Highbridge. No quantities:—

W. M. Dubin	£575 0 0	Jesse Emery	£422 0 0
Sales Cook	524 0 0	F. Hucker	400 0 0
R. I. Stead	520 0 0	J. Dunn	399 10 0
H. W. Pollard	425 0 0	E. Preece, Bristol*	372 0 0
E. Scott	423 7 6		

* Accepted.

KIDDERMINSTER.—For taking down and rebuilding two shops and premises, Bull-ring, for Mr. W. P. Hordern. Mr. J. M. Gething, architect, Oxford-chambers, Kidderminster:—

Meanley & Co.	£1,377 10	Bishop & Sons	£1,232 0
Benman & Co.	1,290 0	Guest & Sons	1,165 0
C. A. Horton	1,274 0	H. Smith, Kidderminster*	1,100 0
J. Jones	1,250 0		
W. Willetts	1,247 0		

* Accepted.

LLANDEBIE.—For building pair of cottages at Castellrhyngill, for Mr. Benjamin Hughes. Mr. David Jenkins, architect, Llandilo.

Lewis Davies	£492 8 11	L. Davies, 5, Marlborough Road, Swansea*	£365 0 0
Peter Evans	370 0 0		
D. H. Jones	369 12 0		
G. Vaughan	365 0 0	T. M. Hughes	360 0 0

* Accepted.

LLANDILO.—Accepted for carpenter and joiner's work and walling for two houses at Alan-road, for M. T. P. Williams, monumental mason, Rhosmaen-street. Mr. David Jenkins, architect, Llandilo:—

Thomas Brothers, Llandilo £125
" " " Walling ..... 3s. 3d. per perch.

LONDON.—For the rebuilding of houses in Marylebone-lane, W. Mr. R. H. Burden, architect:—

Gould & Brand	£3,077 0	Matthews Bros.	£2,919 0
Bywaters & Sons	3 042 0	F. T. Chinchen, Kensal Green*	2,647 10
Holliday & Greenwood	3,033 0		
Killby & Gayford	2,965 0		

* Accepted subject to modification.

LONDON.—For the erection of a block of school buildings, Whitehall Place, Forest Gate, for the West Ham School Board. Messrs. J. T. Newman & Jacques, 2, Fen-court, E.C., Architects to the Board. Quantities by Messrs. R. L. Curtis & Sons:—

Munday & Son	£19,614	Lorden & Son	£17,633
Hearle & Farrow	18,260	Kirk, Knight, & Co.	17,685
Maddison	18,101	Gregar & Son	17,597
Stimpson & Co.	18,050	G. Sharpe*	17,534
Reed & Son	17,737		

* Accepted subject to the approval of the Education Department.

LONDON.—For rebuilding No. 11, Charing Cross-road, W.C., for Mr. E. J. Tulk. Mr. Robert Willey, architect, 33, New Bridge-street, E.C. Quantities by Mr. A. Howard, South Kensington:—

Nye	£2,697	Rowe	£2,299
Durrant	2,634	Nightingale	2,295
Fraies & Son	2,592	Foord & Son	2,162
Clarke & Bracey	2,525	Meller	2,146
Woodward & Co.	2,459	Richardson	2,130
Holliday & Greenwood	2,345		

LONDON.—For the erection of laundry, &c., at the workhouse, Cornwallis-road, Holloway, for the Guardians of St. Mary, Islington. Mr. Wm. Smith, architect, 65, Chancery-lane, W.C.:—

Thompson	£4,62 10	Barrett & Power	£3,290 0
Yerbury & Sons	3,610 10	Stevens Bros.	3,020 0
Coulsell Bros.	3,360 0	Williamson & Son	2,843 0
Baxter	3,337 0	Peck, Hornsey*	2,839 0

* Accepted.

NEWBURN-ON-TYNE.—For making-up two back streets, &c., Lemington-on-Tyne, for the Urban District Council. Mr. Harry W. Taylor, Surveyor, District Council Offices, Newburn-on-Tyne:—

Babe & Scott	£465	G. Mangan	£221
W. Craig	284	G. E. Simpson, Elison-terrace, Newcastle-on-Tyne*	210
Nicholson & Elliott	239		
J. Henderson	235		

* Accepted.

PENTRE (Wrexham).—For the erection of school buildings for the Broughton School Board. Mr. J. E. Lash, architect, 5, Temple-row, Wrexham:—

Davies & Griffiths	£2,049 0 0	E. Bradshaw	£1,820 0 0
W. E. Samuel	1,990 0 0	Samuel Moss	1,800 0 0
Williams, Wycherley, & Co.	1,962 3 6	Thomas Williams, Southsea, Wrexham*	1,795 10 0
James Hughes	1,900 0 0		
W. H. Thomas	1,889 10 0	Harrison & Griffiths	1,760 0 0
Peleg. J. Jones	1,851 9 0	William Owen	1,746 12 2
J. Whittingham	1,823 10 0	A. & H. Hulse	1,725 0 0

* Accepted.

RIBCHESTER (Lancs.).—Accepted for the erection of Free Church buildings. Mr. J. A. Seward, architect, 16, Lune-street, Preston:—

L. Livsey & Sons, Ribchester £1,585

ROTHERHAM.—For the erection of school buildings, Almaroad, for the School Board. Mr. H. L. Tacon, architect, 11, Westgate, Rotherham. Quantities by the architect:—

Rd. Snell	£6,699	Chadwick & Co., Masbro' (accepted)	£6,339
Robt. Snell	6,600		

ROTHERHAM.—For the erection of school buildings, Scholes, for the U.D. School Board. Mr. H. L. Tacon, architect, 11, Westgate, Rotherham. Quantities by the architect :—

Duncan & Jones	£1,625	J. Tradewell	£1,280
W. Bell	1,539	Robt. Snell, Masbro*	1,280
Rd. Snell	1,338		

* Accepted.

UPPER BATLEY (Yorks.).—Accepted for alterations, &c., to Elmwood House. Messrs. Holtom & Fox, architects, Westgate, Dewsbury. Quantities by the architects :—

Masonry, Joinery, and Plastering.—T. Richardson & Sons, Staincliffe £357 10
Plumbing.—F. Newsome, Dewsbury 65 10

WEST HAM.—For the supply of Thames ballast and granite pitchers, for the Town Council. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E. :—

Thames Ballast.

	Per ton. s. d.		Per ton. s. d.
Wm. Howard	1 7	Wm. Gibbs	1 4½
G. Rutty	1 6	J. Byford	1 4
Fry Bros.	1 5½	W. C. Cunis	1 3
J. Jackson	1 5	W. G. Harris, Stratford (accepted)	1 2
Wm. Griffiths	1 5	Shelbourne & Co.	1 1¾
T. Adams	1 5		

Granite Pitchers.

	Guernsey. Per ton.	Aberdeen. Per ton.
J. Jackson	£1 12 6	£1 12 6
Mowlem & Co.	1 12 0	1 12 3
Wm. Griffiths	1 10 0	1 11 9
G. Rutty	1 10 3	1 11 3
J. Leith	—	1 9 6
Wm. Gibbs	—	1 7 9
T. Adams, Wood Green (accepted)	1 8 0	1 7 6

WEST HAM.—For bricks and Portland cement, for the Town Council. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E. :—

Bricks.

	Blue Stafford. £ s. d.	White Gault. £ s. d.	Peterboro' Wire Cut. £ s. d.
J. Jackson, Plaistow	3 17 6	2 6 0	1 19 0*
A. H. Lavers	4 1 0	2 6 0	—
J. J. Lee, Manchester *(a)*	3 4 6*	—	2 6 6
Skey & Co., Ltd.	4 9 3	—	—
South Stafford Brick Co. *(b)*	4 4	—	—
Coates & Rutley *(c)*	—	2 4 0	—
Doulton & Co.	4 6 0	—	—
Wood & Ivery, Ltd.	4 2 6	—	—
W. Gibbs	—	2 2 0	—
Bishop, Pratt, & Co. *(d)*	3 14 0	—	—
E. Barnett *(e)*	3 12 6	—	—
Buckley Brick and Tile Co., Ltd.	5 0 0	—	—
P. & S. Wood *(g)*	3 11 0	—	—
J. Hamblett *(h)*	4 5 0	—	—
J. Byford	3 17 0	2 7 6	2 0 0
J. H. Sankey *(k)*	3 16 0	1 19 6	1 19 6
S. J. Sadler *(j)*	3 16 0	—	—
Fletton Brick Co. *(k)*	—	—	1 17 0
A. W. Itter *(l)*	—	—	—

Portland Cement.

	Quality A. For Sewers. £ s. d.	Quality B. For Paving Works. £ s. d.
Robins & Co., London	1 9 0	1 2 1*
W. Griffiths	1 9 6	1 4 9
A. H. Lavers	1 9 6	1 7 6
Page, Calnan, & Co.	1 6 9	1 5 9
Hilton, Anderson, & Co.	1 7 6	1 4 9
Dartford Portland Cement Co.	—	1 4 0
J. Byford	1 6 11	1 2 11
Trechmann, Weekes, & Co., Ltd.	1 6 3	1 4 0
J. J. Lee, Manchester	1 5 11*	1 3 11
J. H. Sankey	1 12 0	1 6 0

* Accepted.

(a) Blue bricks 57s. 6d., and Peterboro' 39s. 6d., at station. *(b)* Delivered at Plaistow Station. *(c)* Delivered at Stratford Station. Bricks as previously supplied. *(d)* Delivered at Stratford Station. Bricks, size 9 by 4½ by 2⅝, at 69s. *(e)* Delivered at railway-station. *(g)* Delivered to Plaistow Station. *(h)* Bricks 2⅝ in. thick, 77s. 6d. *(i)* Blue bricks to be best pressed blue Staffordshire bricks. Gault bricks to be best Medway pink gault bricks. *(j)* Best pressed blues. Delivered at Plaistow Station. *(k)* Delivered at Plaistow Station. Cheaper quality 35s. Bricks 2⅝ in. thick, 34s. ; white facing bricks 5s. extra on above prices. *(l)* London size 29s., large size 32s. 6d. Delivered at station.

WEST LULWORTH (Dorset).—For the erection of a house for Major Robson. Mr. F. R. Bates, architect, Arlington-chambers, Newport, Monmouthshire. Quantities by architect :—

C. E. Slade	£1,676 3 0	A. Harvey	£1,175 16 0
G. Runyard	1,433 18 4	J. Miller	1,147 0 0
G. Hobbs	1,410 0 0	D. Hitching Parkstone, Dorset*	1,105 0 0
W. J. Chinchen	1,300 0 0		

* Accepted subject to some reductions.

WIMBLEDON.—Accepted for the erection of villa at Griffiths-road, Wimbledon, for Mr. A. Edwards. Mr. J. R. Harding, C.E., architect, Epsom :—

T. Cornborough, Wimbledon £668

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to DOUGLAS FOURDRINIER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

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PUBLISHER'S NOTICES.

Registered Telegraphic Address, "THE BUILDER," LONDON.

THE INDEX and TITLE-PAGE for Volume LXVII. (July to Dec. 1894) were given as a supplement with the number for Jan. 12, last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each ; also

READING CASES (Cloth), with Strings, price 9d. each.

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Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" cannot be guaranteed for any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before 10 a.m. on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office,* 46, Catherine-street, Covent Garden, W.C., *free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

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READING CASES, { NINEPENCE EACH. By Post (carefully packed), 1s.

ESTABLISHED 1866.

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SLATE MERCHANT,

SLATER and TILER.

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Oakeley - Palmerston,

And other description of Slates ready for immediate delivery to any Railway Station.

Applications for Prices, &c., to

BETHNAL GREEN SLATE WORKS,

BETHNAL GREEN, LONDON, E.

TO CORRESPONDENTS.

W. D.—(Below our limit).—J. K. & Sons.—R. H. W.—(Amounts should have been stated, unless the work is being done at a schedule of prices, in which case the fact should have been mentioned.)—"Wet."—(We cannot attend to communications in connexion with which no name or address of writer are enclosed.)—F. J. W.—(The appointment is hardly within our province to notice.)—

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR ; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

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FOR ALL THE PROVED KINDS OF

BATH STONE.

FLUATE, for Hardening and Preserving Calcareous Stones and Marbles.

HAM HILL STONE.

The attention of Architects is specially invited to the durability and beautiful COLOUR of this material. Quarries well opened. Quick despatch guaranteed. Stonework delivered and fixed complete. Samples and estimates free. Address, The Ham Hill Stone Co., Norton, Stoke-under-Ham, Somerset. London Agent : Mr. E. A. Williams, 16, Craven-st., Strand, W.C. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

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Estate Plans and Particulars of Sale promptly executed.

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METCHIM & SON, 20, Parliament-st. S.W.

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COMPANY,

Suffolk House, Cannon-street, E.C.

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F. BRABY & CO.

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CYLINDERS FOR HOT-WATER CIRCULATION.

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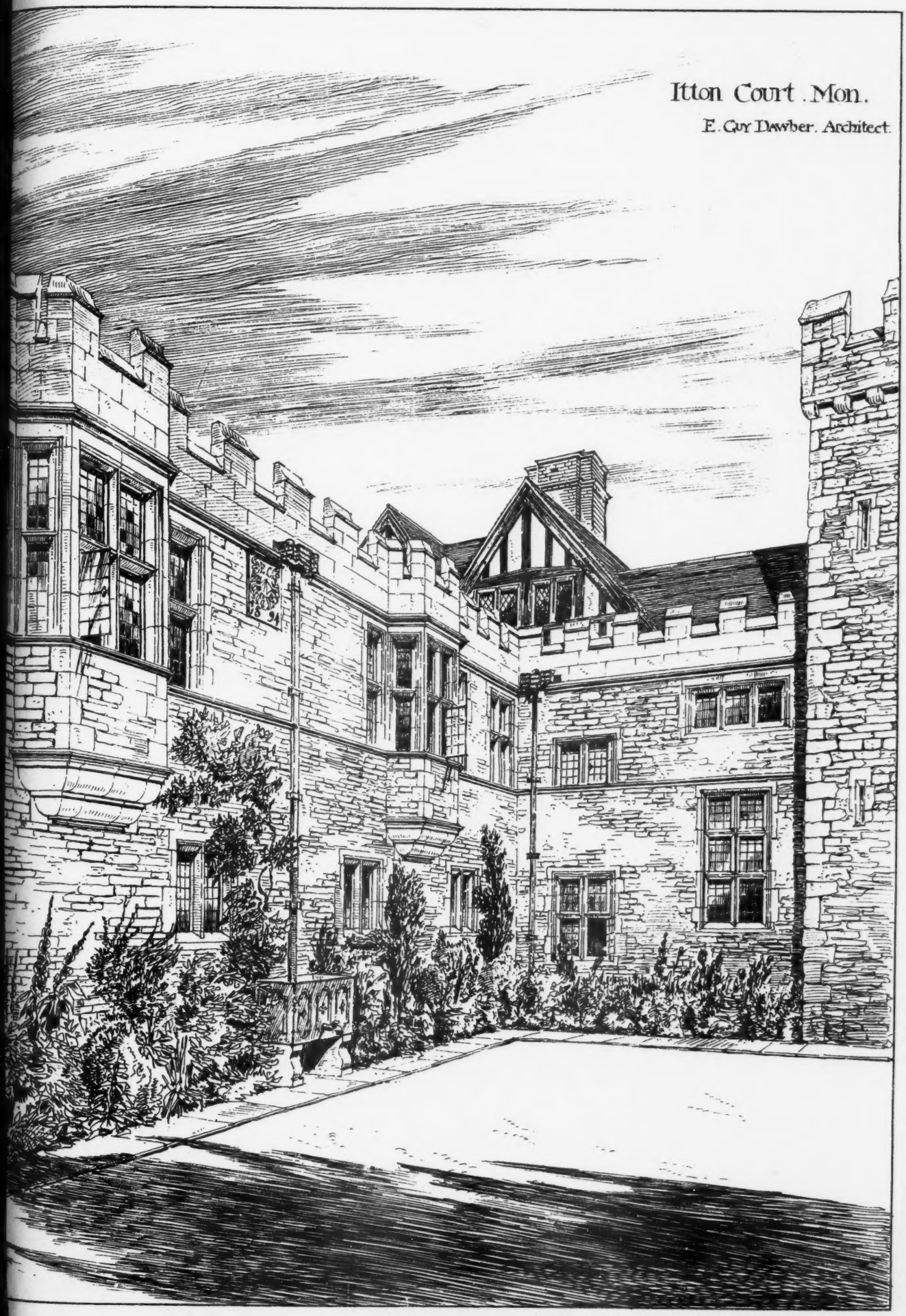
352 to 364, EUSTON-ROAD N.W., and
218 and 220, HIGH-STREET, BOROUGH, S.E.

LIVERPOOL :
6 and 8, HATTON GARDEN.

GLASGOW :
47 and 49, ST. ENOCH-SQUARE.



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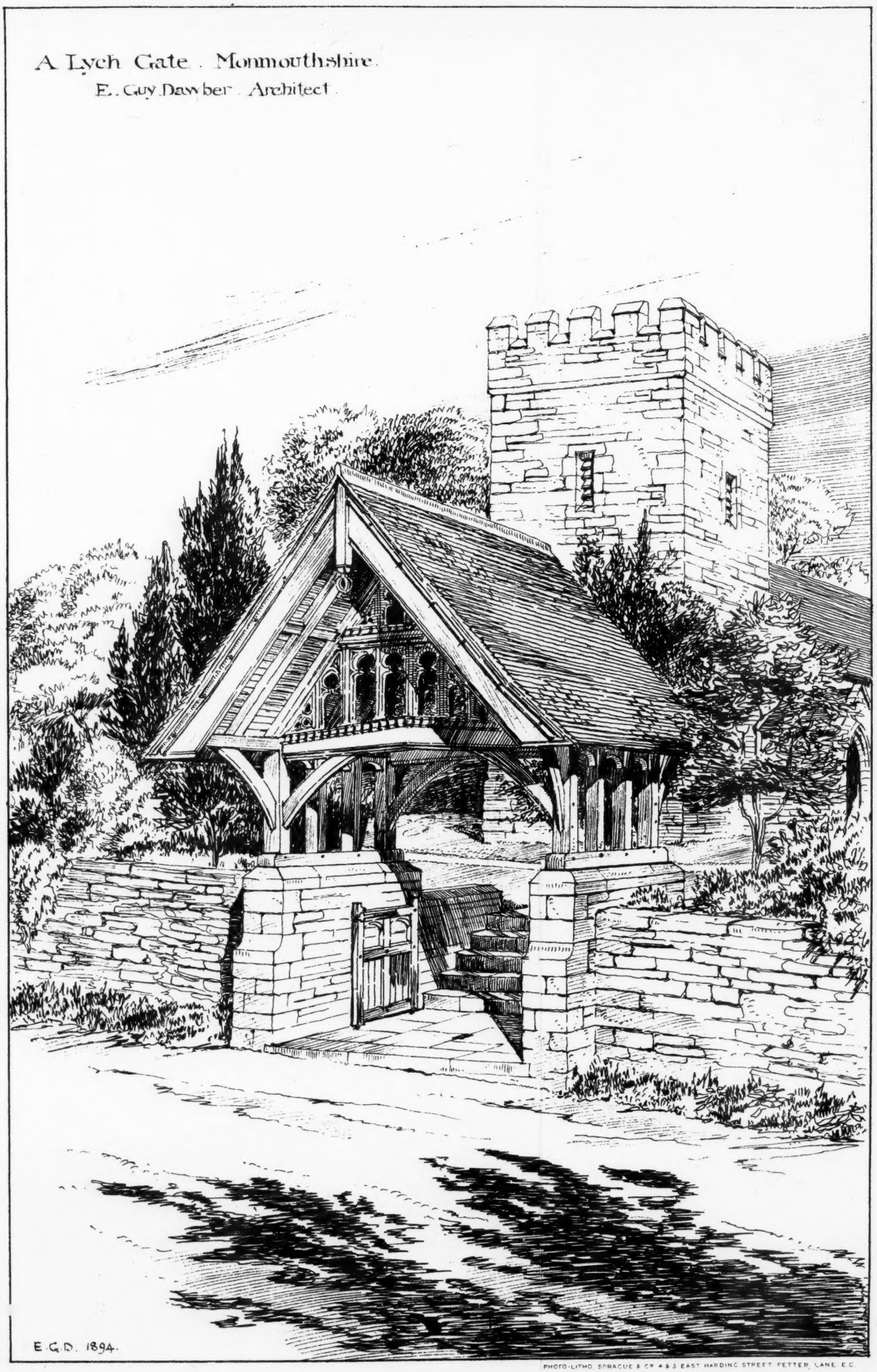
A Lych Gate . Monmouthshire.

E. Guy Dawber . Architect.



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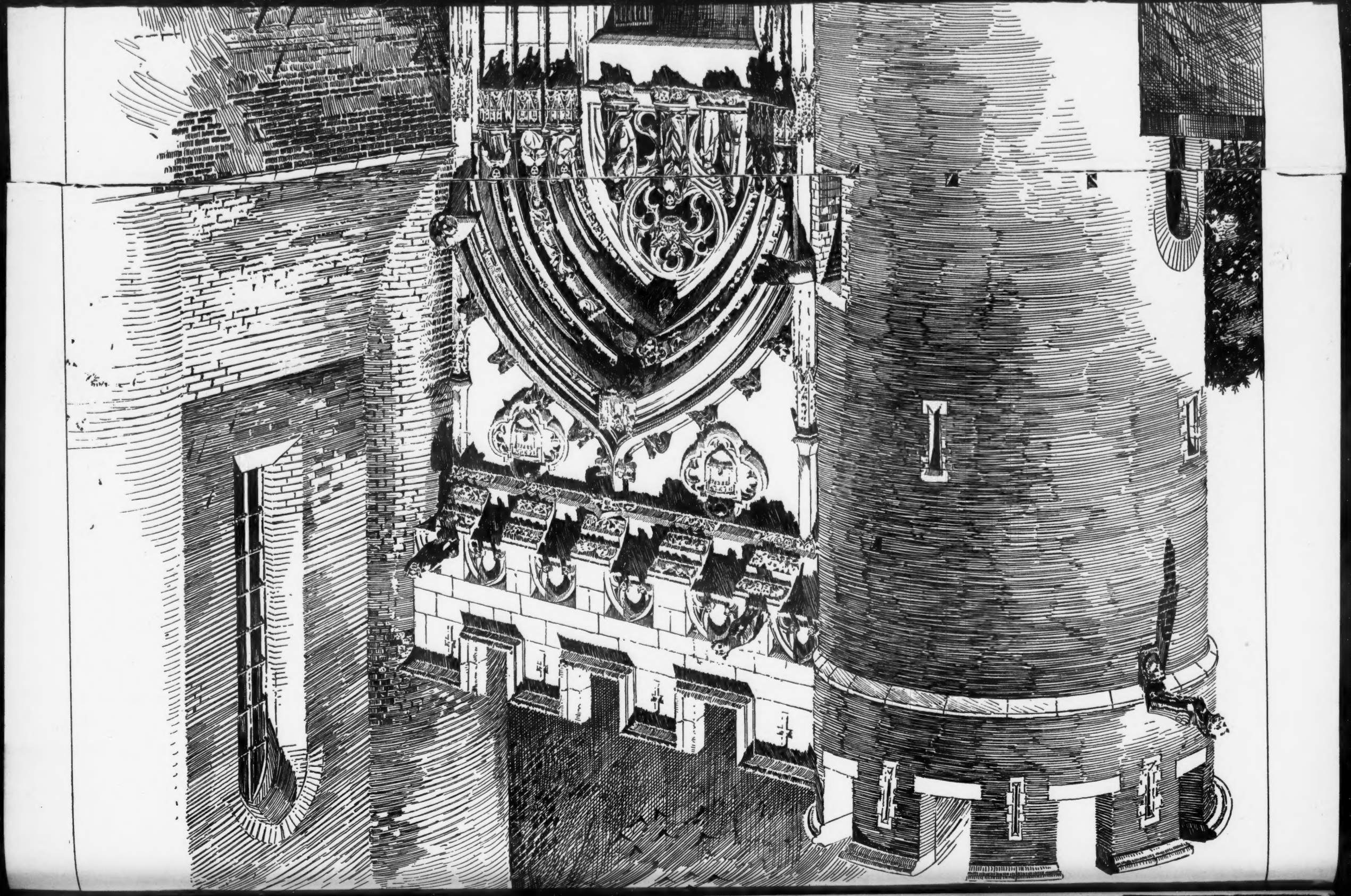

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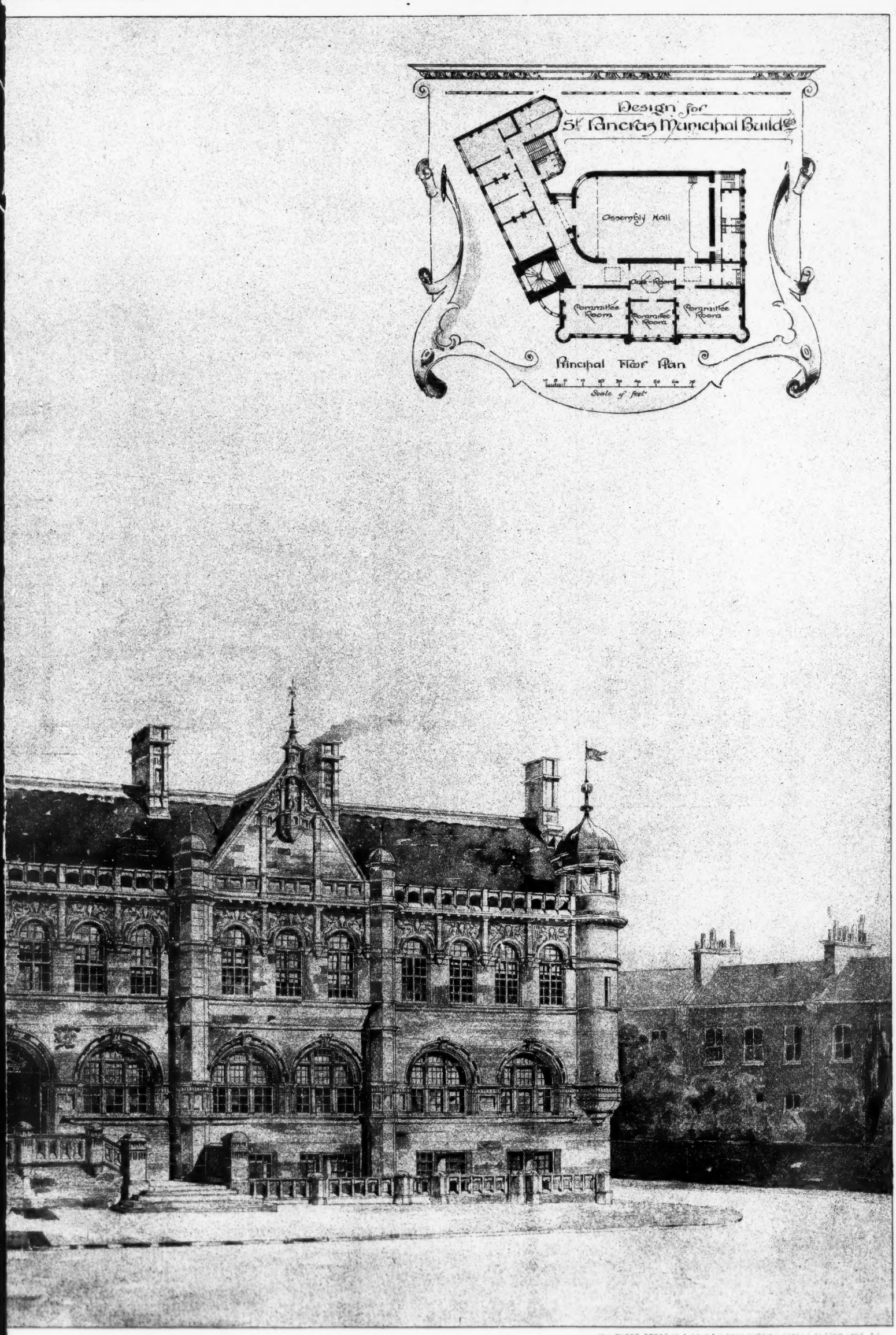
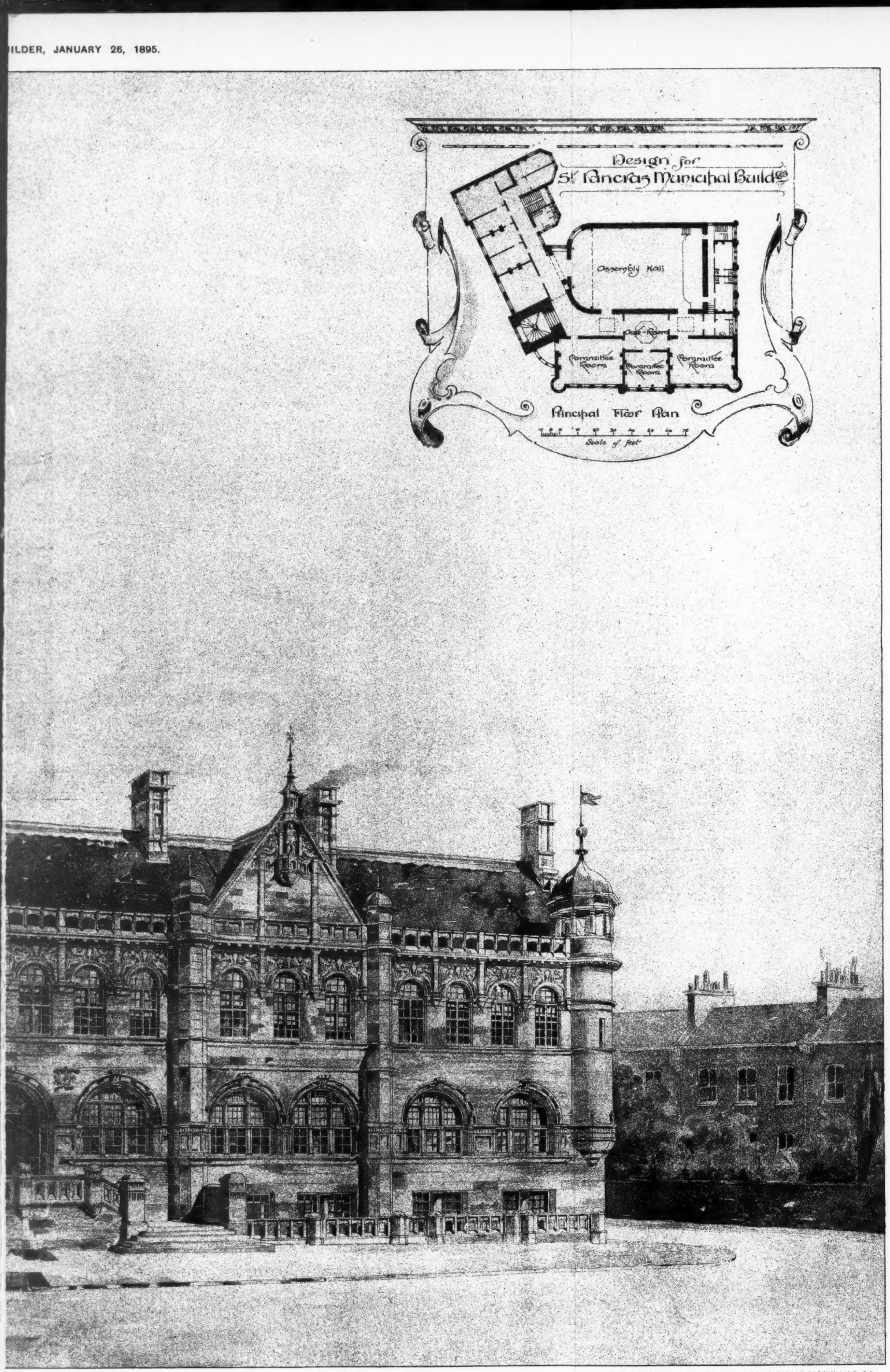
COMPETITION DESIGN FOR ST. PANCRAS MUNICIPAL BUILDINGS.—By M



IPAL BUILDINGS.—By Messrs. F. H. Tulloch and Langton Dennis.

COMPETITION DESIGN FOR ST. PANCRAS MUNICIPAL BUILDINGS.—By Messrs. F. H. Tulloch and L'Angton Den



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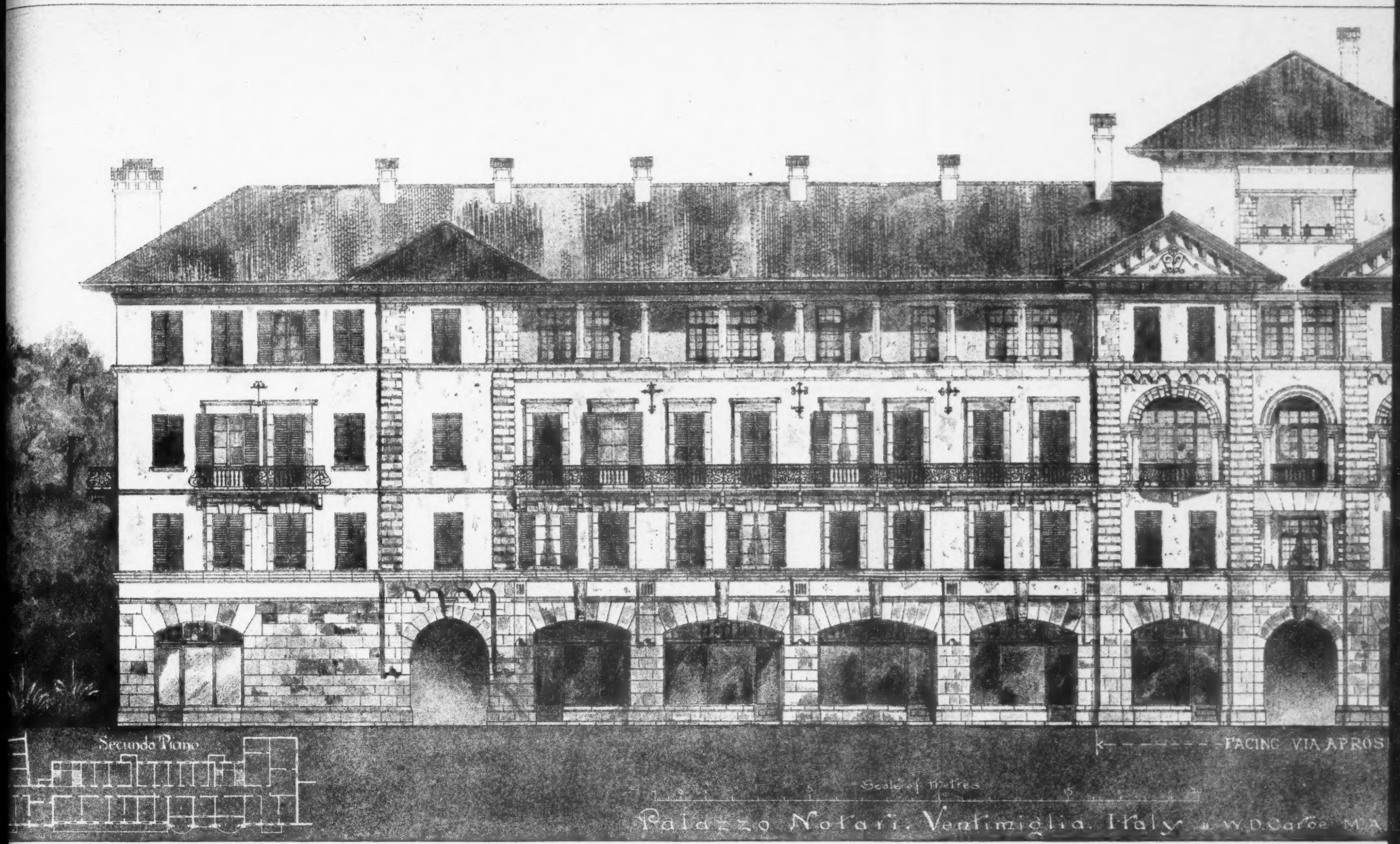
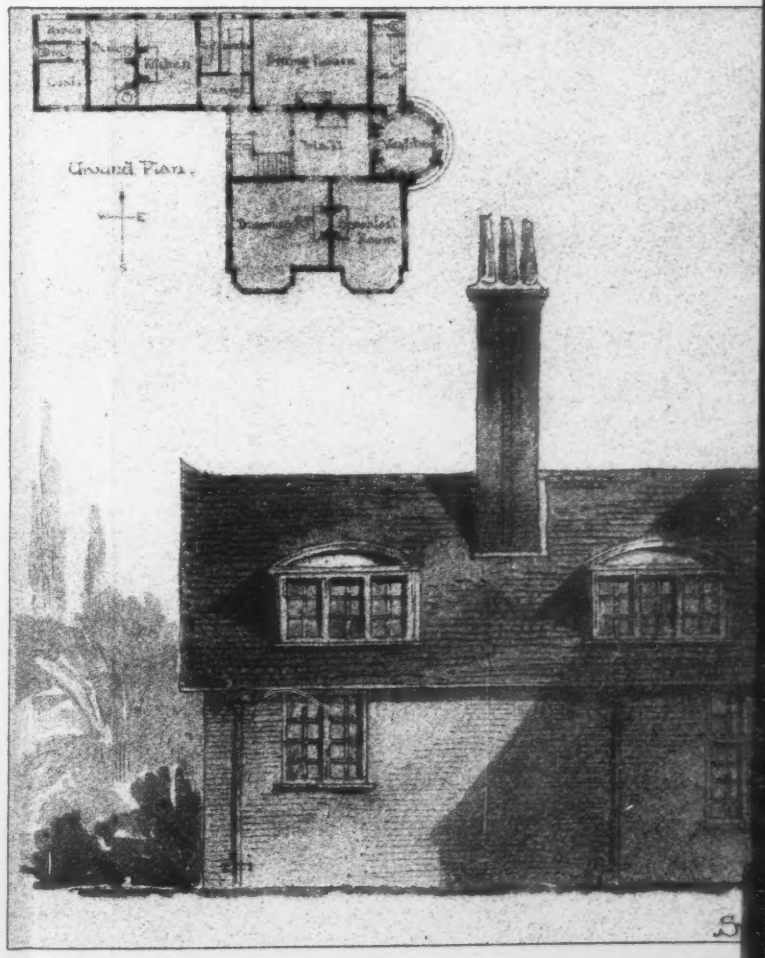
CIPAL BUILDINGS.—By Messrs. F. H. Tulloch and Langton Dennis.

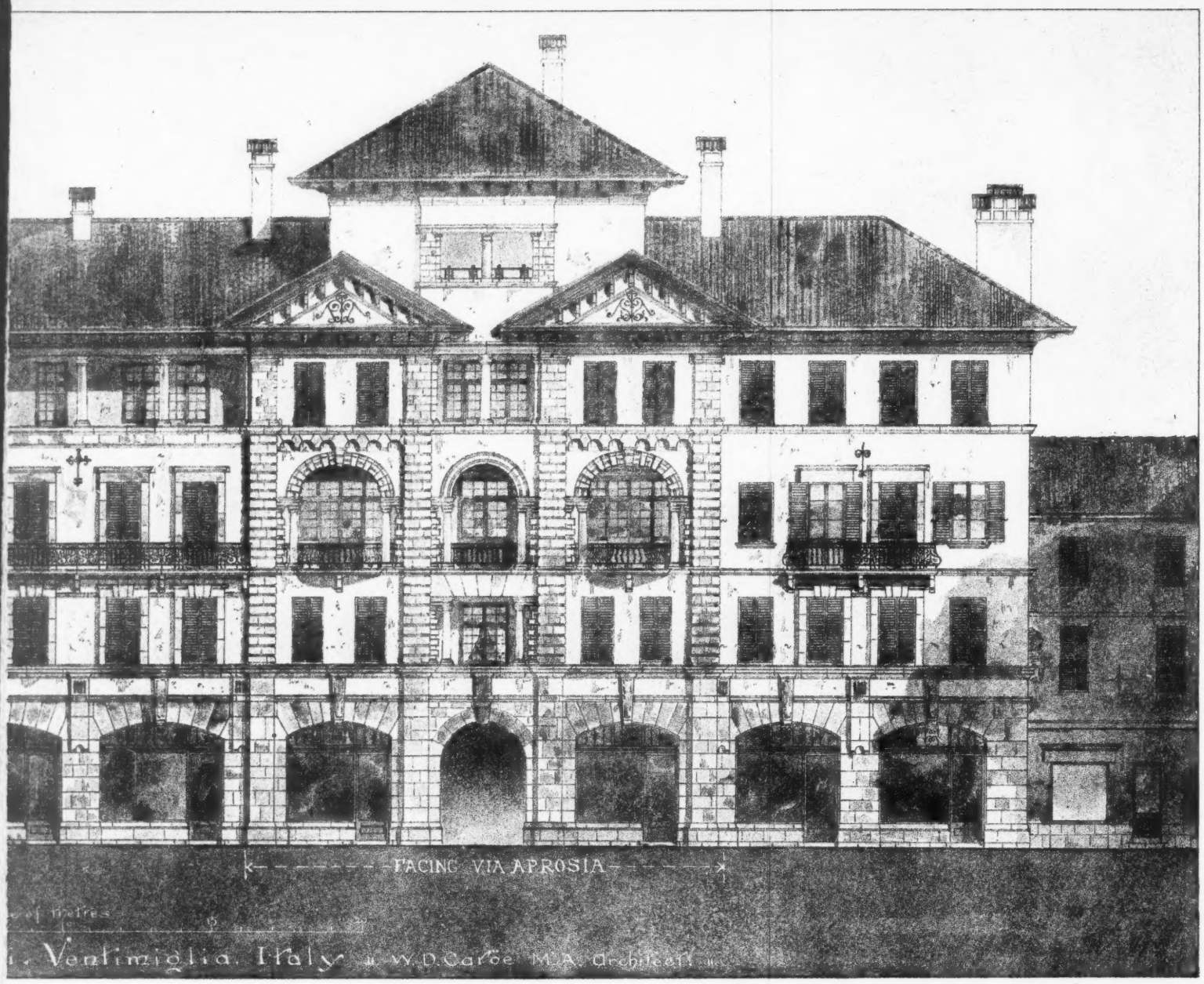


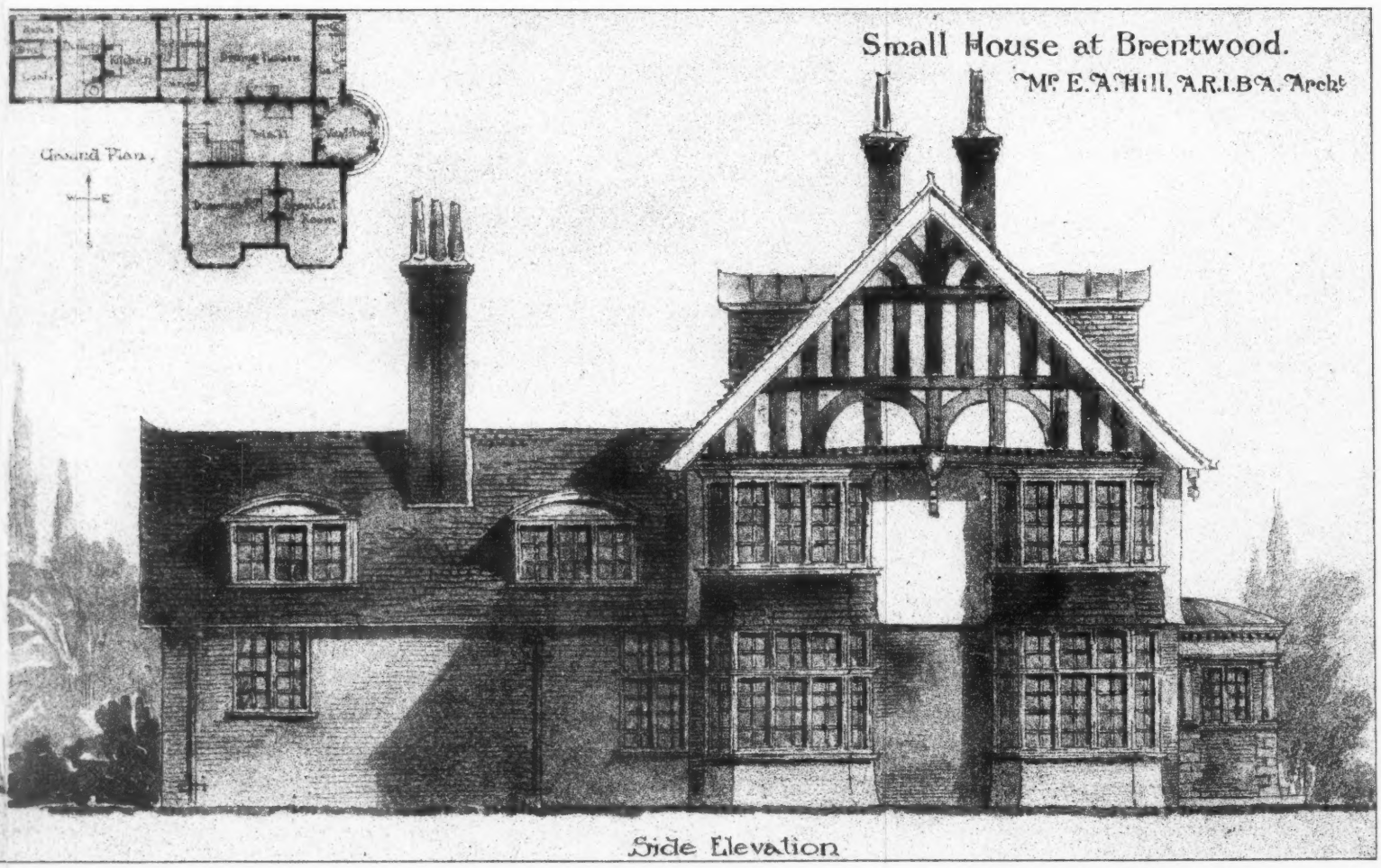
Small House at Brentwood.

Mr E.A.Hill A.R.I.B.A. Archt

Front Elevation







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